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O. D. MUNN, S. H. WALES, A. E. BEACH.

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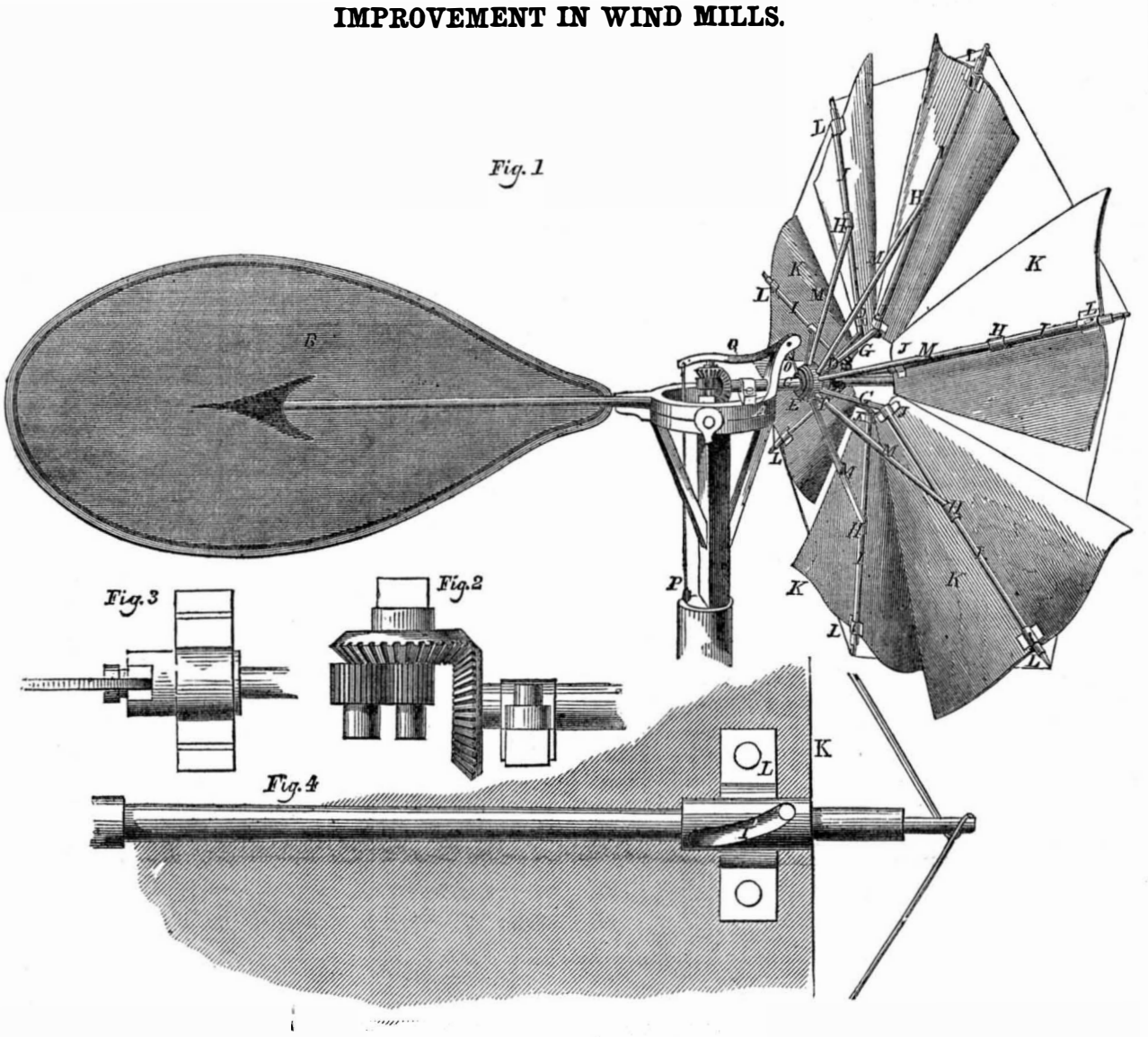
Agricultural Science, Droughts, and Pulverizing the Soil.

The State Agricultural Chemist of Maryland, Mr. Higgins, has published a paper showing the necessity of droughts to replenish the soil with mineral substances, carried off to the sea by the rains, and also taken up by the crops, and not returned by manure. These two causes, always in operation, would, in time, render the earth a barren waste, in which no verdure would quicken, and no solitary plant take root, if there was not a natural counteraction by drought, which operates to supply this waste in the following manner: During dry weather, a continual evaporation of water takes place from the surface of the earth, which is not supplied by any from the clouds. The evaporation from the surface creates a vacuum, so far as water is concerned, which is at once filled by the water rising up from the subsoil of the land; the water from the subsoil is replaced from the next strata below, and in this manner the circulation of water in the earth is the reverse to that which takes place in wet weather. With this water also ascend the minerals held in solution, the phosphates and sulphates of lime, carbonate and silicate of potash and soda, which are deposited in the surface soil as the water evaporates, and thus restores the losses sustained as above stated. The author of this theory appears to have taken considerable pains to verify the fact by a number of interesting experiments. The subject is worthy the attention of men of leisure and of education, who pursue the rational system of blending chemistry with agricultural science."

[The above is from the Philadelphia *Ledger*, and contains evidence within itself of correctness. In connection with this, let us point out the benefits of keeping the soil well pulverized or cultivated, to prevent the mineral and other food of plants from being carried away with rains. England has a moist climate, subject to great rains, and is seldom visited with droughts, and yet more wheat is raised to the acre than anywhere in the world. Why is this? Simply on account of the universal practice of draining and keeping the soil in a highly pulverized state. When the soil is kept porous, it absorbs ammonia and carbonic acid gas from the atmosphere, and when rain falls these are carried down into the soft porous soil, and are taken up as food by the plants. If the soil were hard and caked, the rains would run violently off the surface, carrying away some portion of the soil, and with it the food so necessary to supply the plants with nourishment. The benefits to be derived from keeping the soil of cultivated fields well pulverized and open, cannot be too highly extolled.

We regret to learn that Mill No. 1, Manchester, N. H., was burned down on the 15th inst. It caught fire by the bottom of the watchman's lantern dropping off among some roving in the carding room. The loss amounts to about $200,000, and 500 hands are thrown out of employment.

IMPROVEMENT IN WIND MILLS.



The annexed engravings represent an improvement in Windmills, for which a patent was granted to Addison P. Brown, of Brattleboro', Vt., on the 3rd, of this month.

The nature of the improvement relates to the method of regulating the obliquity of the sails, by which they are rendered self-adjusting, according to variations in the velocity of the wind.

Figure 1 is a perspective view of the principal parts; fig. 2 is a view of the gearing for transmitting the motion from the wind or driving shaft to the main driven vertical shaft, and figs. 3 and 4 are sections—the latter on an enlarged scale, showing an arm of the wind sail, and the curved slot, I', which allows the sail to adjust itself to the wind pressure. Like letters represent similar parts. A is the turn-table on which the wind shaft is supported and rotates; B is the vane; C is the main driver shaft rotated by the wind sails. D is a collar securely fixed on this shaft by a screw. E is the hub which carries the sails. It is allowed to slide on the shaft, C, to which it is secured by a key working in a spline or slot, but rotates with the shaft. F is a spiral spring, having its tension to keep the collar, D, and hub, E, separate. G G are metal bars, connected by hinges to the hub, D. H are thimbles which slide on the arms, I, that carry the sails. J J are hinges firmly attached to the sails, K K. L is a hinge (one on each arm) it is heavy, being virtually a weight, the centrifugal force of which governs the sail; this hinge is also a thimble enclosing the arm of the sail, as shown in fig. 4, and it has a helical slot, I', in it in which is a pin, that turns the sail edgewise, when the centrifugal force of L is increased by an accelerated speed. M M are braces which extend from the arms of the sails to a sliding collar on the other side of the one D. O is a sliding washer pressed up against the hub by a weight, P, suspended from a jointed bent lever, Q, thus enabling the attendant to increase the force of the spring, F, by increasing the weight.

Any sudden impetus of the wind moves the sliding hub, overcoming the tension of the spring, F, lifting the weight, P, and the bars, G, by means of the thimbles, H H, which push the sails further out upon the arms, while the helical slots, I', and pins in them turn all the sails simultaneously edgewise, to an extent proportionate to the increased force of the wind. Any acceleration of the wind regulates the positions of the sails, as described, and thus they are self-adjusting. The motion is communicated from the shaft, C, by bevel gearing, as shown in fig. 2, or in any of the usual ways whereby rotary motion is communicated to the vertical shaft, and from thence to any machinery in the building below.

More information may be obtained by letter addressed to the patentee, at Brattleboro', Vt.

Grasses for Reclaiming Sand Drifts on the Sea Shores.

There has been received in the Patent Office, from Holland, the seeds of the sea reed, (*arundo arenaria,*) and the upright sea lyme grass, (*elymus arenarius,*) which have long been used in that country for reclaiming the sand drifts on the sea coast. These seeds have been imported for experiment all along the Atlantic coast, from Maine to Florida. The nutritive matter of these grasses is not sufficient to make them worthy of cultivation out of the influence of the salt spray. The elymus arenarius rather exceeds the sea reed in nutritive qualities; but from the habit of the latter in its natural place of growth, it is of greater utility, particularly when combined with the former, as it binds the loose sands of the sea shore, and thereby raises a durable natural barrier against the encroachments of the ocean upon the land. Indeed, the effect of the two grasses combined in protecting coasts from the wasting influences of storms and currents is such, that Holland owes her very existence, in a considerable degree, to their preserving influences.

In the reign of George I., the acts passed for the planting and preserving the same from injury were extended to the coasts of England. In passing further penalties for its inviolability, it was rendered penal not only for an individual—not even excepting the lord of the manor—to cut the bent, but for any one to be in possession of any within eight miles of the coast. This plant is also applied to many economical purposes—hats, ropes, mats, &c., being manufactured from it.

A New Destructive Bomb Shell.

A number of our cotemporaries state that Prof. Anderson, formerly of the Clinton Institute, has invented a new destructive shell, which can soon wrap any fortification in flames, and destroy any city in fifteen minutes. From the description of it, Sebastopol will soon be nowhere. When it is fired and strikes, it sends up a large sheet of flame, which burns with great intensity for a considerable period. It appears to be a shell filled with combustible materials, such as turpentine, resin, chlorate of potash, ignited much in the same way as the explosive shells of Mr. Hubbell, of Philadelphia.

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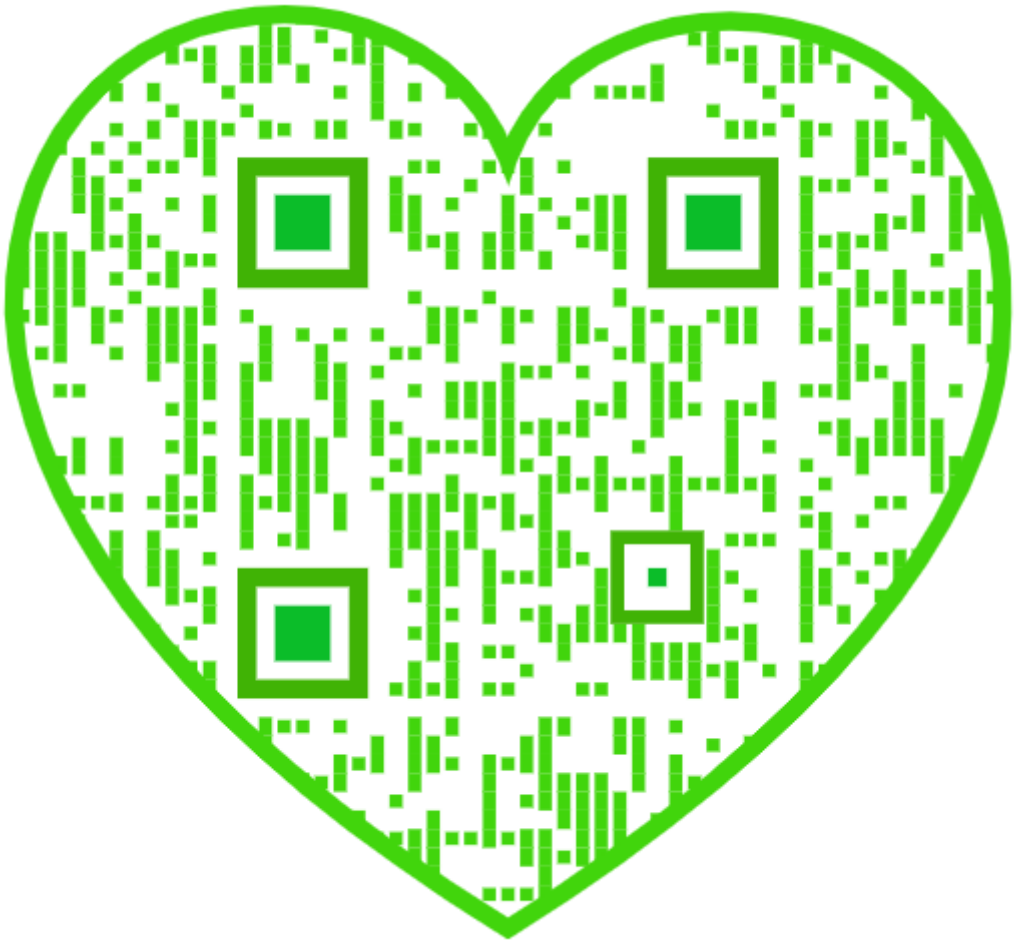

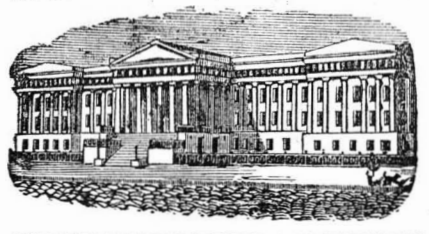

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office,

FOR THE WEEK ENDING JULY 17, 1855.

MODE OF MOUNTING ORDNANCE—Charles F. Brown, of Warren, R. I.: I claim mounting a cannon or any other piece of ordnance, substantially as described, in a carriage, A, of spherical, spheroidal, or other circular form, externally, which carriage is arranged to close the port or embrasure through which the piece works, but to turn freely therein in a horizontal or nearly horizontal direction, and which has an opening, c, within it of suitable size and form to receive the gun and to allow it the necessary upward and downward swinging movement on its trunnions, whereby an efficient protection is afforded against the entrance of the enemy's shot or projectiles, and the smoke of the discharge is excluded, and at the same time a desirable range in a lateral and vertical direction is maintained.

[The object, nature, and construction of the foregoing improvement is so clearly set forth in the above claims, that no further explanation is needed. It is an important invention connected with the art of war—one which would be of vast importance to the Russians at Sebastopol, did they now possess the same. It was only by the last steamer's news that we read an account of the terrible losses and difficulties which they experienced for want of some easy means of closing the embrasures of their forts when exposed to the fire of the Allies. They had erected massive walls of masonry within, between the guns, which greatly cramped them for room and air; they had dug caves behind the guns, into which the men could sink and save themselves from exploding shells; and they had been driven to other extremities from the same cause, which weakened their efforts at defence. In our opinion no fortress is complete without this improvement. We presume it will be speedily adopted not only by our own government, but by all others. Foreign patents have already been obtained through the Scientific American Agency. The invention reflects great credit upon the genius of the patentee, who is an old and successful inventor.]

LANTERNS—C. H. Butterfield, of South Lancaster, Mass.: I do not claim any particular form of spring, nor the application of my improvements to any particular style or kind of lamp or lantern.

But I claim attaching a yielding or springing plate to the cap, in combination with a match holder, so that lifting or throwing off the cap shall light a match placed so as to light the wick or lamp.

WINDOW BLINDS—W. H. Bixler, of Easton, Pa.: I do not claim the employment of a single fusee applied to a blind or shade, for they have been previously used.

But I claim the attachment of two fusees, f h, connected by a cord, j, a spring, i, being attached to the one fusee, h, and the cords, c c, to the fusee, f as shown, and for the purpose set forth.

[This invention relates to the spring window curtains used in carriages and for other purposes. It consists in a combination of two conical fusees with a coiled spring, at one end of the window sash roller, in such a manner that the force of the spring is equalized, and the sudden jerking up of the curtain is avoided. The two fusees are connected by a cord which winds from the small end of one of the fusees on to the large end of the other. This device is simple, but it is very useful. Curtains thus arranged are raised evenly, neatly, and steadily, consequently they are less liable to be torn, and the apparatus does not get out of order.]

NUT MACHINES—R. H. Cole, of St. Louis, Mo.: I claim arranging the movable bottom, j, of the nut box, in such a manner in relation to the movements of the punch, d, that when a nut is being formed in the nut box, its bottom will be forced against a yielding support, for the purpose of insuring in all cases perfectly shaped nuts, and enabling the machine to self-adapt itself to bars of different thicknesses, substantially as set forth.

INVALID BEDSTEADS.—Benjamin Eastman, of Philadelphia, Pa.: I make no claim to elevating the patent by means of frame, A, with cords and pulleys, as such has been done before.

I claim the apparatus described, composed of a shaft, H, arms, P, hooked cords, Q, in combination with the detachable sacking, and vertically moving shaft bearings, arranged and operating substantially as set forth, for the purposes specified.

OPERATING VALVES OF PUMPS—Jacob Edson, of Boston, Mass: I do not claim a tripper for the purpose of opening the valves by the descent of the piston, as such have been used before.

But I claim the peculiarly formed tripper described, in combination with the curved cap of the valve, D, by which means a single tripper is made to open both valves, in the manner set forth.

I also claim the twisted partition, Q, for the purpose set forth, whereby the cylinder is divided into two water passages which deliver the water upon the opposite side from that on which they receive it.

FORMING METAL TUBES—Edwin Ells, of Ansonia, Ct.: I do not claim the employment of rollers alone to give form to the tube, neither do I claim bringing the strip or skelp of metal of which the tube is to be made to a form whose transverse section resembles the letter U, when this is performed by separate means unconnected with the rollers.

But I claim arranging the rotary bur-cutter, I, between the preparatory U-shaped die, a b, and the rollers, G G', substantially as described, whereby the scarfing operation is performed at the same time as the forming operation, and the forming machinery serves to hold and feed the strip or skelp in a suitable manner to receive the scarfing operation.

[The foregoing patent relates chiefly to the manufacture of brass, copper, and iron lap-welded or brazed tubes, for boilers and other purposes. Heretofore the scarfing or beveling of the outer edge of the metal, in order to complete the external rotundity of the tube, has been done by hand. Mr. Ells' machine, not only forms the tubes rapidly out of the skelp, or flat strip, but also scarfs them off as fast as formed. The whole operation is clearly set forth in the claim. This is an ingenious and valuable improvement.]

ADJUSTABLE VISES—John Fraser, of New York City: I am aware that adjustable vises have been previously used, but the jaw only has been arranged so as to turn, the screw remaining stationary, and consequently they operated very imperfectly, as the line of pressure, and the axis of the screw were not in line.

I do not claim, therefore, an adjustable vise irrespective of the construction shown.

But I claim having the screw, F, which passes through the movable jaw, I2, pass through a nut, G, so arranged as to turn, and cause the screw and movable jaw to turn, when wedged or taper-shaped articles are to be held, so that said jaw, E, will conform to the obliquity or taper form of the articles, and cause them to be securely grasped by the jaws.

[This improvement consists in attaching to the fixed jaw of the vise, a movable nut, through which the screw passes, whereby the loose jaw can be turned or adjusted at pleasure, to suit the surface of the article to be held. No matter what the angle or bevel of the article, the jaw adjusts itself accordingly, and so a firm hold is always secured. The improvement increases the expense of a vise but very little. It is a good invention and will find a wide introduction. Logan Vail & Co., of New York city, are the assignees and owners of the patent.]

HARROWS—William Gourley, of Clarke County, Va.: I do not claim any of the parts separately; nor do I claim so attaching to a clod cutter, or harrow, a roller that may be adjusted, to any given hight from the ground, as this has been done before.

But I claim arranging in connection with a clod cutter, a cutting roller, which may adapt itself to the inequalities of the ground, and also be made to throw its weight upon the clog cutter, or not, as desired, substantially in the manner and for the purpose set forth.

SAFETY RAILROAD DRAW-BRIDGES—J. K. Gamble & W. P. Gamble, of Philadelphia, Pa.: We claim the contrivances described, or their equivalents, so arranged and combined as to constitute a safety railroad draw-bridge, substantially as set forth.

[The many lamentable accidents which have occurred on some of our railroads, within the past few years, in consequence of neglected draw-bridges, have given developement to several new mechanical devices for affording better security at such crossings. One of the best of these inventions forms the subject of the above patent. The patentees propose to place side branch tracks at each end of the bridge, and to have the switches of these branches permanently connected with the draw, in such a manner that when the draw opens the switches move and connect the side track with the main. Consequently, should a train approach while the draw is open, it must of necessity pass on to the side track, and avoid accident. The side tracks are to be inclined, so as quickly to stop the headway of the train. This invention prevents the possibility of accident, whether arising from the carelessness of signal-men or the neglect of engine-drivers. It is a good improvement; we commend it to the attention of railroad corporations.]

ROSIN OIL LAMP—Francis Blake, of Needham, Mass.: I claim, first, the air chamber, G, within the lamp, in connection with the circuitous passage, F', for the purpose set forth.

Second, the button, I, in combination with the button, L, and opening, H, whereby the quantity of air that is admitted to the interior of the flame is adjusted to the hight of the button above the wick, as described.

Third, I claim the draft regulator, N, constructed and operating in the manner substantially as set forth.

FAN BLOWER—J. C. Gartley and Jacob Fox, of Philadelphia, Pa.: We also claim, where an ordinary parallel hub is used, a circular plate or pieces of plate fastened to the hub and blades, E, of blowing wheel, inclosing the greater portion of the side of blowing wheel towards the side, K, to answer the same purpose for which the larger portion of the conical hub is intended, which is to prevent a central reacting current after it has passed through the blowing wheel.

We claim the combination and arrangement of fan blower, as described.

We do not claim the parts described, separately; but we claim the combination, in the manner set forth or shown, for the purposes named.

EXPANDING AUGER OR BIT—L. H. Gibbs, of Washington, D. C.: I claim, first, the adjustable plate, B, with the rib, d, the lip, j, the index holes, c c c c, in it, combined with the auger, A, with slot, D, the tapering pins, g g, and set screw, h, as described and for the purposes set forth.

RAILROAD CAR COUPLING—John Ryan, of Wilmington, Del.: It is obvious that whilst the gist of my invention lies in the peculiar forms of the coupling bar and heads, yet these forms may be varied and still produce the same effect, and I should claim the right of changing the forms of both or either, so long as I do not part from the general characteristics of the invention. I do not claim a gravitating hook, nor do I claim a side moving hook for self uncoupling, independent of its particular connection with the draw heads.

But I claim the surfaces of the hook, and inside and outside of the buffer mouth, so arranged and constructed that the hook, presented in a vertical position, shall be caused to rotate to a horizontal position on entering, and resume its vertical position when driven in to hold the cars, and by a deviation of the cars to one side, caused to rotate again to a horizontal position, so as to uncouple by said deviation, and the leverage between the hook and heads, the buffer mouth not allowing the hook to pass either way, except when horizontal.

GUIDES FOR SEWING MACHINES—Frederick R. Robinson, of Worcester, Mass.: I claim the combination of the seam gauge or guide with a sewing machine.

CROSS-HEAD ATTACHMENT FOR WORKING STEAM ENGINE VALVES—John B. Stoit and Alexander Ferguson, of Troy, N. Y.: We claim the method of operating the valves of steam cylinders by the process described, to wit: By a series of trips attached to, and sliding with the cross head of the piston, which trips operate in succession upon the arms of a vibrating shaft connected with the valve rod through cams fixed near the ends of the arms, the trips themselves consisting of a variable and adjustable one to move the valves so as to cut off the steam before the end of the piston's stroke, leaving the eduction passage slightly open; a second, to shift the valves a little further, at the end of the stroke, so as to take steam for the new stroke, and open wider the eduction passage; and a third, to shift the valves so as to open the induction and eduction passages to their fullest extent. The two first movements of the valve being made by the movement of the cross head in one direction, and the other by the reverse movement thereof, the last operation being produced by the joint action of the spring cam on the arm, K, and the recessed trip, V, substantially as set forth.

SAWING DOWN TREES—Matthew Ludwig, of Boston, Mass.: I claim attaching the connecting rod, F, to a sleeve, G, which works upon a bar, H, attached to the framing, A, the bar, I, of the saw, J, being attached to the sleeve, G, and the bar, H, having an arm, K, attached to it, which arm has a lever, L attached, one end of which is provided with a friction roller which bears against the bar, I, and keeps the saw to its work, in consequence of the cord, e, and weight, M, attached to the opposite end. The bar H, being arranged as herein shown, so that it may be turned, and allow the saw, J, to cut in a vertical or horizontal position.

[The above patent is for a tree cutter—a species of mechanism which has long been needed. Without drawings, we could not explain its parts so that they would be properly understood. The intention of the inventor has been to make a sawing apparatus, which should combine cheapness, strength, portability and efficiency, to such a degree that lumbermen and others could conveniently take the machine into the forests and save not only time, but labor and timber, in felling trees and clearing up land. So far as we can judge, Mr. Ludwig has accomplished this object We look for very favorable results from his invention]

CONSTRUCTING IRON SHIPS—Otis Tufts, of Boston, Mass: I claim constructing the hull, decks and bulkheads of ships, with a double shell of iron, inter-fastened, for greatest strength, with binders, substantially as described.

METALLIC BLINDS, FOR DOORS AND WINDOWS—William E. Worthen, of New York, N. Y.: I further state, that certain parts of my invention may be usefully applied out of the connection shown, and I also wish to be distinctly understood that I do not claim as of my invention, a blind made up of slats capable both of rising and falling and of vibrating, except when combined with pivots, etc., as set forth, and also that I lay no claims to raising and vibrating cords or chains, except when attached and located as claimed.

But I claim first, a tubular metallic window blind slat, containing in the cavity thereof a non-conductor of heat, constructed and applied substantially as specified.

Second, I claim pivots and grooves, or their equivalents, applied substantially as set forth, in combination with metallic slats capable of vibration and of rising and falling, by which a firm secure shutter is constituted, while the ordinary uses of inside Venetian blinds are still retained.

Third, I claim a locking bar, substantially such as specified, in combination with slats capable of vibration and motion, in a plane vertical or nearly so.

Fourth, I claim arranging arms to which are attached vibrating chains; and also vibrating chains, as set forth, in a recess separated from the slats proper, substantially as set forth.

And lastly, I claim a supporting chain, as described, in combination with slats capable of vibration and motion, in the manner and for the purposes substantially as specified.

WATER WHEEL—William M. Wheeler, of Upton, Mass: First, I claim closing the buckets by means of the band or chain in connection with the arms and springs, operating as described.

Second, I claim the guard with its slides, operating in the manner and for the purposes described, or any other substantially the same.

CHURNS—Moses D. Wells, of Morgantown, Va.: I claim the construction of the dasher with an inclined continuous channel, e, substantially as set forth, for producing the upward flow of a continuous hollow column of cream at each down stroke of the dasher, and thus favoring atmospheric action, as specified.

EXCAVATING MACHINE—Edwin Williams, of Covington, Ky.: I do not claim simply an excavating shovel, having an extended handle, capable of longitudinal and vibratory motion, such having been heretofore employed.

But I claim an excavating shovel or scoop, provided with one or more cables, as described, or their equivalents, and having its rear portion or handle hinged to one extremity of a boom, which has longitudinal and vibratory motion about an elevated pinion, or its equivalent, the unattached extremity of said boom being made to counterbalance the scoop, in the acts of dumping, &c., as explained.

GAS BURNING GRIDIRONS—Edwin D. Willard, of Washington D. C.: I do not claim the perforated tubes, nor the corrugated plate.

But I claim the gas burning tubes in combination with a corrugated plate, acted upon by rack and pinion, and moving upon slides, the whole being combined substantially as set forth.

LOOMS—Edward Wood, of Philadelphia, Pa.: I am aware that several combinations of devices are in use, for the purpose of operating an elastic or yielding stopper for the picker of looms, and also for allowing the free motion of shuttle boxes, which are dependent for their action either upon the shuttle itself, or upon the motion of some part of the loom. I therefore do not claim the application of the principle for arresting the picker by a combination of devices arranged so as to make the stopper elastic or yielding to the blow of the shuttle, and allowing the free motion of the shuttle box up and down.

But I claim the rigid or non elastic picker stopper, A, constructed and arranged upon the lay, substantially as described, and operated by means of the rigid link or curved rod, B, or its equivalent, when in connection with the said stopper, A, and the frame of the loom, substantially and for the purposes set forth.

HARVESTERS—David Watson, of Petersburgh, Va.: I do not claim the diagonal arrangement of a series of rotary cutters, or the diagonal cut of a certain portion of one or more rotary cutters.

But I claim the arrangement of a reciprocating cutter or cutters diagonally to the line of motion of the machine, substantially as specified.

LANTERNS—Charles Waters, of Brooklyn, N. Y.: I claim the application of the spring catch, e, and lips, f, substantially as, and for the purposes set forth.

[This patent covers an ingenious spring arrangement for securing the lamp to the bottom of the lantern. It is a very convenient and complete affair. By its use the lamp may be removed from or returned to the lantern, with the utmost facility and safety. Lanterns fitted with this improvement cost no more than those of the ordinary construction, while they are far preferable.]

TURBINE WATER WHEEL—Henry Van De Water, of Troy, N. Y.: I am aware that the French turbine (Jonval's) receives power from the water the same as mine, viz.: first by gravity, and then by suction; the first column operates by the same law as in ordinary wheels. The second part of the column, that is to say, from the bottom of the wheel to the lower part of the fall, would, in ordinary wheels which discharge in the open air, be of no additional effect to the wheel, as the water would leave this point without velocity, and would only fall by its gravity. I do not claim, therefore, placing the wheel, H, within a cylindrical casing, the lower end of which is immersed in the "tail water," underneath the wheel, for that has been previously done.

But I claim first, the employment of the guide or concave conical projection, C, at the lower part of the casing, A, in combination with the cylindrical gate, E, the above parts being constructed and arranged as shown, and for the purpose as set forth.

Second, I claim the chutes or guides, i, placed above the wheel, H, in combination with the slides, j, which form a gate by which the water is admitted in proper quantity upon the wheel, and tangentially thereto, as described.

Third, I claim surrounding the wheel, H, with an annular chamber or recess, g, in combination with the buckets, h, of the wheel, H, when said buckets are formed as shown, viz, with smaller spaces between their lower ends than their upper ends, for the purpose of causing the water to act upward against the lower surfaces of the buckets, and thereby relieve the step of the shaft, D, of the weight of the wheel and said shaft, as shown and described.

[The improvements secured in the above patent were quite recently described and illustrated in our journal—No. 41. If any of our readers would like to acquaint themselves with the principles of what the inventor regards as the latest and best water wheel invention of the day, let them study the engraving and its context to which we have above alluded. We regard the invention as an excellent one.]

SELF-REGULATING WINDMILL—Joseph Dickinson and Oliver White, of Richmond, Ind.: We claim applying to a windmill or motor, a governor or regulator, which shall change the angle of the vanes with the plane of the periphery of the wheel, thus regulating the force of the wind upon them, by the force of the wind or motive power alone, by means of the face plate, F, spring I, rods, G, and cranks, H, or their equivalents, constituting an arrangement effecting the purpose set forth.

KNITTING MACHINES—John Pepper (assignor to the "Franklin Mills,") of Franklin, N. H.: I do not claim a rotary set of rib needles operating in connection with a stationary cam, in the manner as represented and described in Letters Patent granted to me on the fifth day of December, 1854; nor do I claim making the needle stationary, and employing in connection with such a movable set of sinkers or jacks whereby the stitches are formed by the successive movements of the sinkers or jacks between the needles.

But I claim making the plain work needle frame or bar stationary, its needles movable thereon, and to operate in connection with sinkers, or the equivalents, as described, and applying thereto a movable or sliding cam bar, K, or its equivalent, so as to operate the plain work needles in succession, in manner as explained, the advantage of such not only being that no forward movements of the sinkers are necessary in order to bring the loops of the yarn into the hooks of the needles, but that such simplifies the machine, and thereby correspondingly diminishes the cost of its construction.

And in combination with the hooked sinkers and ribbed needles, made to operate substantially as described, I claim the series of cast-off sinkers, or those formed without hooks, the same being arranged in the sinker bar, and not only so as to admit the rib needles to work between the hooked sinkers, but so as to render the machine capable of performing either plain or ribbed work, as specified.

I also claim making the rib needle take the place of the front or hook of the sinker, in forming the loop for the rib stitch.

MACHINERY FOR PREPARING WOOL FOR COMBING—Albert Reinhardt (assignor to Nas. Schlumberger, of Guebeviller, France,) of New York, N. Y.: I claim the combination of the feeding, working and drawing off apparatus, constructed and arranged in the manner set forth, the feeding and drawing off apparatus being so combined as to be alternately brought into action with the working drum, and brought to a state of rest when not in working contact with the drum, all as specified.

DEVICES FOR SEALING PRESERVE CANS—W. H. Elliot, of Plattsburgh, N. Y: I claim the use of the plug, i, or its equivalent, in sealing exhausted vessels, with or without the tube, j, in connection with the plunger, h, or its equivalent, operating in the manner set forth.

FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim constructing fire arms with a hollow cylinder, A, containing chambers, a a, as described, in connection with barrels, B B, substantially in the manner and for the purposes set forth.

I claim loading the chambers, a a, by foot pedal, G, straps, H H, levers, K K, operating the plungers, M, in combination with the simultaneous capping of the nipples by lever, N, straps, 5 and 6, cross bar, O, and plungers thereon, for removing caps from cylinder, P, and placing them on the nipples, as set forth.

I claim drawing the hammer, T, by lever, R, and bar, S, furnished with spring, W, and catch thereon, or its equivalent, in connection with the angular liberating projection on spring, W, and the liberating post, I5, for the purposes set forth.

I claim drawing the hammer back, in the manner set forth, in combination with the simultaneous swabbing of the discharged chambers, in the manner substantially as described.

I claim likewise the swabbing for containing the swabs, n n, as described, furnished with sponge, or its equivalent, the whole operating substantially in the manner and for the purposes set forth.

FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim the elevating of the manifold fire arm by the screw, F', nut, G', on swiveled arms, a' a', as described, in connection with pulleys, H' and E', chain, K', or their equivalents, substantially as set forth.

I claim the adaptation of the shield to the manifold fire arm, or similar machine, substantially in the manner and for the purpose set forth.

FOR COCKING REPEATING FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim the application of a refrigerator, constructed as described, to the barrel or tubes of fire arms, for the purpose of keeping said tubes from undue heating, substantially in the manner set forth.

TILE MACHINES—Gottlelb Graessle, of Rossville, Ohio: I claim the combination of the two endless chains, corresponding molds, and pressure rollers, formed and constructed substantially as described.

MACHINERY FOR DRESSING TREENAILS—Delia A. Fitzgerald (assignee of Jesse Fitzgerald, through J. Pierce), of New York, N. Y. Patented originally August 26, 1849: I claim the use of the cutters, a, in combination with the enlarging and heading apparatus, or apparatus analagous thereto, when used for the purposes substantially as set forth; and this I claim, whether any one or more of the parts of the enlarging and heading apparatus, or apparatus analagous thereto, are used separately or collectively in combination with the said cutters, whereby treenails are cut and shaped by the use of such mechanical devices as are described.

SHIP'S CAPSTANS—John B. Holmes (assignor to John R. Pratt,) of New York City: I make no claim to employ compound gearing for working capstans, for I am aware that gear wheels have been applied and combined before for the purpose of overcoming a variable resistance in capstans, nor do I claim the shape, form, or construction of the different parts, when separately considered.

But I claim the arrangement of the stationary drum-head, in relation to the stationary base and spindle, and movable body, the same being moved by gearing and cranks, as set forth and described.

[An engraving of this invention will be published next week.]

ALARM BEDSTEAD—J. C. House, of Lowville, N. Y.: Not confining myself to any particular style or pattern of bedsteads, I claim the employment of the tilting frame or bed bottom in combination with a suitable catch or series of catches, connecting it with a clock in such a manner as to be tilted at any required hour by the action of the clock; the whole constructed and arranged substantially as set forth.

RAILROAD CAR COUPLING—A. G. Heckrotte, of New York City: Disclaiming the coupling and uncoupling of cars by eccentric tumbler, revolving roller, turning dog and coupling bar, as secured by the patent granted to W. O. Bussey, 17th July, 1847, I claim the method described of releasing the tumbler by double branched sliding guards, ff, combined with the dog bar, D, whereby the rigid attachment of the box is avoided, and the same rendered capable of attachment to the ordinary spring bumpers, as set forth.

BOTTLE FASTENINGS—Jules Jeannotat, of Paterson, N.J.: I claim forcing or pressing a cushion, H, of india rubber or other suitable material, over or upon the mouth of the bottle, A, by means of a lever, E, inserted in a plate, D, which plate, D, has flanches, F' F, attached to it by rods or links, c.; the plate, D, also having attached to it a plate, G, to which the cushion, H, is secured; the above parts being arranged and applied to the bottle, as shown, for the purpose set forth.

[The above is a contrivance which is attached to the neck of the bottle, near its mouth, for the purpose of holding down the stopper, and thus preventing the entrance of air or the escape of the contents of the vessel. A sort of frame is made to grasp the lip or shoulder at the mouth of the bottle, and there is a pivoted cam placed above, operated by a small lever, so arranged that when the cork is placed over the mouth, the lever may be pressed, and the cam brought firmly down upon the stopper. By lifting the lever, the cam rises and the bottle may be instantly opened. This invention obviates the necessity of wiring, sealing, corkscrewing, and other inconvenient modes of opening and closing bottles. It is a good thing.]

TREBLING A SINGLE STRAND, AND TWISTING SEWING THREAD—Harold Kelsea, of North Branch, N. H.: I do not claim the combination of doubling, twisting, and reeling, mechanism, whereby a strand may be doubled, twisted, and reeled, so as to be made into a skein.

But I claim the combination of the endless band, M, its hitching heads or knobs, N O, and the stationary frame hitching knob, as applied together to the drum rollers and twisting mechanism, and made to operate so as to treble and enchain a strand, substantially as specified.

WIND MILL—J. S. Morgan, of Highland, Ill.: I do not claim, separately, forming the wings or sails in pairs, and connecting the same by pinions, so that the two parts of the sails or wings will move simultaneously towards and from each other, for this has been previously done, but for the purpose only of allowing the sails to close when moving against the wind, and to open when acted upon by the wind, there being no device applied for the purpose of regulating the wings or sails to insure an equal motion of the mill.

I claim connecting the weights, m, to the wings or sails, h, by means of the cords or chains, j j, said wings or sails being arranged in pairs, and connected by pinions, g g, and weights, and cords or chains, arranged substantially as shown and described.

[Mr. Morgan's wind-mill is arranged on the horizontal plan, and is a self-regulator. The wings are hinged in their centers, and fold together backwards, so that, if need be, only their knife edge will be presented to the wind. The greatest power of this mill is when the wings are wide open. The tendency of any pressure of the wind is to close them and so stop the wheel. But this is counteracted by having a compact weight and cord on the end of each wing, which always keeps the wing open until the pressure of the wind exceeds the resistance of the weight. The wings close and open in accordance with the force of the gale, thus preserving, at all times, an equal and steady rotation of the main shaft. There is no limit as to the size and power of these machines. Self-regulating wind mills are rapidly coming into use. Mr. Morgan's improvement we regard as one of merit.

BEDSTEADS—Tyler Howe, of Cambridgeport, Mass.: I claim the described bed bottom, consisting essentially of the slats, E, and the springs, F, constructed and operating in the manner substantially as set forth.

DERRICKS—Edward Mingay, of Boston, Mass.: I claim attaching to a derrick a lever, having its fulcrum in the boom of the same, and actuated by a rope and windlass, substantially as described.

APPARATUS FOR HEATING FEED WATER TO LOCOMOTIVE ENGINES—David Mathew, of Philadelphia, Pa.: I claim the arrangement of the tubular heater, sectional cones, and short exhaust pipes in relation to each other and to the smoke box, as set forth.

MORTISING WINDOW BLINDS—Joseph A. Peabody, of Lowell, Mass.: I claim the bar or carriage, N, which carries the blind stile, and which is moved by lever or otherwise, and the changeable and adjustable arms, O O, or their mechanical equivalents, one end of each of them being connected to the bar, N, while their opposite ends are so connected, by pins or otherwise, to the machine that these arms are changeable and adjustable so as to impart any desired angle to the mortises, essentially in the manner and for the purposes set forth.

I also claim the carriage, B, or its equivalent, which may be vibrated or moved by lever or otherwise, for carrying a series of revolving mortising chisels; this carriage, and the chisels attached to it, being so moved that the chisels will form or cut all the angular mortises in one window blind stile at one operation, essentially in the manner and for the purposes set forth.

WRECKING PUMP (ROTARY)—Oliver Palmer, of Buffalo, N. Y.: I claim the combination of the arms, B B, constructed in any equivalent manner, with the spiral partition, L.

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ATTACHING METALLIC HEELS TO INDIA-RUBBER SOLES—P. T. Parmelee, of New Brunswick, N. J.: I do not claim the mere insertion of India-rubber within metallic rims or casings, for the purpose of forming the heels of boots and shoes, for that has been previously done.

But I claim having the metallic rims or casings, A, formed with recesses, a, arranged in any proper way, so that the soft or plastic India-rubber, B, mixed with the proper vulcanizing materials, may be fitted therein, and the rubber and rims or casings be permanently locked together by subjecting the rubber to steam heat and vulcanizing it, when fitted within the rims or casings for the purpose as set forth

[The nature of Mr. Parmalee's invention consists in providing an open skeleton boot heel of iron, and filling up the same with vulcanized rubber. Iron heels, filled with common rubber, have long been made, and are good so far as they go. But they soon wear out and become worthless. Vulcanized rubber, on the other hand, will last, we had almost said, forever. To fill the skeleton with vulcanized or hardened rubber, and have it stay fast, is what many have essayed but never accomplished. Mr. Parmalee's plan is to place common molten rubber into the skeleton, and then introduced the vulcanizing substances—sulphur and other ingredients—the skeleton and contents being subjected to steam heat during the process. The skeleton is, of course, beveled, or has projections inside to assist in retaining the rubber. The old fashioned "iro nheels" will now have to step aside. It is a good improvement.]

ADDITIONAL IMPROVEMENT.

SCREW WRENCHES—Lorenzo D. Gilman, of Troy, N. Y. Original Patent, March 27, 1855: I claim adding the tube, E, with the nut, G, surrounding the rod, C, of the movable jaw, to the arrangement of the adjustable toothed plate with springs, the toothed shank, and the eccentric with its strap attached to the toothed plate, as set forth.

RE-ISSUES.

COTTON PRESSES—Cyrus J. Fay, of North Lincoln, Me. Patented originally Jan. 31, 1854: I claim first, the use of the slats or guide strips, E, arranged and operating in the manner substantially as set forth.

Second, I claim the tenons upon the transverse bars of the doors, which, entering mortises in the frame-work, relieve the hinges from the strain which would otherwise come upon them.

Third. I claim hinging the doors of the press, in the manner described, to prevent them from violently bursting open, when the bar which confines is removed.

Administration of the New British Patent Law.

The London *Mining Journal*, in reference to the administration of the new Patent Law, contains the following keen sarcasm:

"God sent food, and the devil cooks."—Legislative wisdom is *supposed* to produce Acts of Parliament, but Governmental Incapacity most assuredly administers them; and although this, like other public journals, is scarcely ever without some complaint of the conduct of our government departments, yet we know of no case where their ill-regulated character is more apparent than in the administration of the new Patent Act, in which we, as promoters of the reform of the Patent Law, feel especial interest, knowing, moreover, that the efficient working of the Patent Law is a matter affecting many of our readers.

Transcendently objectionable, however, is the practice pursued with regard to special applications to the Lord Chancellor for extension of the time to seal and specify letters patent in cases where those legal processes have been delayed by accident, such application being almost always answered unfavorably, by an endorsement of "No order," unless the party make application by counsel in open court (at considerable expense;) in which case, petitions previously so answered having been at first placed in the hands of the Clerk of the patents, to be laid before the Lord Chancellor, have been afterwards favorably answered by his lordship in court. In fact, the whole practice of the Government Patent Office seems to be intended to defeat the professed object of the Act of Parliament (except as regards the department administered by Mr. B. Woodcroft which is admirably conducted.)

Heat Without Fuel.

MM. Beaumont and Mayer have made a machine which may be seen at work at their establishment on the Quai Valmy, in Paris; it contains 400 litres of water, which is made to boil in two hours. A cone of wood which turns in a cylinder, so as to produce the necessary friction, is covered with tow, and that tow, in order that it may not catch fire, is kept constantly moistened by a stream of oil which runs on it. The heat gradually increases, until at last steam is generated.—[Exchange.

The same thing was accomplished in this city about four years ago, but it is a worse than useless invention, as it will require just as much fuel to work the machine to produce friction to make the water boil, as it does to apply the fuel direct to boil the water. Count Rumford boiled water by friction more than half a century ago.

A locomotive exploded on the Vermont Central Railroad, on the 10th inst. The engineer, fireman, and conductor, were killed. This case should receive a severe investigation.

(For the Scientific American.)

Sir John Franklin and Dr. Kane—A Spiritual Communication.

I have, since the commencement of the present volume of your valuable journal, met with several articles on Spiritualism, which somewhat awakened in me an interest in the matter. One article, in which you said there was something strange and unaccountable about it, particularly attracted my attention, and as I am of a very inquisitive nature, I concluded directly to investigate the matter to find out whether it was an "elephant" or a "humbug," or what else it might be. I accordingly visited a "medium" of this city to see the "elephant," or the "humbug," as I till then thought it was; but I can give you my oath upon it, that I neither saw the elephant nor the humbug. I saw things that I would have doubted if even "Uncle Sam" himself had sworn to them as truths, for I nearly doubted my own senses the next day.

As I was informed, however, on this first visit, that I was a medium myself, I was determined to see more of these wonderful things, that I might be perfectly sure that what I had seen was truth and reality, and I consequently attended the circle of the above-mentioned medium regularly, until I succeeded in forming a circle of my own, which enabled me to give the subject a still closer examination.

On the first and second meeting of my circle nothing but some very powerful physical manifestations, and the names of a few deceased relatives, were received. Upon the third meeting, however, (which was on the 23rd of June last) the following communication, purported to come directly from the Spirits of Eternity, was received, accompanied by the positive order that I should write it to you and ask you to publish it in the SCIENTIFIC AMERICAN. The communication, as you will perceive, relates to Sir John Franklin and Dr. Kane, as follows:

"Sir John Franklin is not in the Spiritual world, he still lives upon the earth with seven more of his original party, and two of his ships. He has been locked up in the North Polar Sea, but has at last found a way through the icy walls again that imprisoned him so long, and he is now safe and well in Buffalo Bay, between 60 and 70° north latitude nearest the Greenland shore.

Dr. Kane has lost about thirty of his men, and is at present near Sir John Franklin. He will soon meet him, and return with him to New York,—a triumph and pride to every truly American heart. . . . ."

Here the communication stopped, but was resumed at the next meeting, which took place on Thursday the 28th of June, as follows:

" . . To-day a terrible storm rages in the arctic regions. It has brought Sir John Franklin and Dr. Kane in sight of one another. They have espied, signalized, and recognised one another, but have been again separated by the storm. Dr. Kane is furthest north: one of his men was washed overboard in the storm, but again taken up, though in a bad state of health.

Sir John Franklin has been directly upon the North Pole of the earth, and has, during his long residence in the arctic regions made wonderful and interesting discoveries and observations that were never known before. Lt. Maury and Dr. Kane are very nearly right in their opinion of the North Polar Sea, as Sir John Franklin will testify when he arrives."

. . . . . .

Here the communication again stopped, with the promise, however, that I would be informed of any particular incidents happening to both parties until they arrived at New York.

I have received several other communications of scientific interest, but as I was particularly ordered by the spirits to send you the above as quick as possible, I will leave them for some future occasion, and only mention in conclusion, that I cannot yet perfectly believe in spiritual intercourse, although there is no power in nature, that I know of which can or will account for such phenomena (called spiritual manifestations,) as I have witnessed since I commenced examining the subject. If, however, the future will prove the above, and some other communications, to be facts, I think I shall then be obliged to be a strong and unwavering Spiritualist, for then it will be to myself, as well as other persons present at the time, a positive evidence, beyond a shadow of doubt, that the communications came from the source they purport to. G. L. W.

Baltimore, July 10, 1855.

[Our correspondent states that if this spiritual communication proves correct he will be compelled to become an unwavering spiritualist. We assure him that his spiritual informant must be an awful ignorant fellow to tell him that Dr. Kane had lost thirty of his men, when the whole expedition numbered only seventeen persons, as follows:

Dr. Elisha K. Kane, Commander; J. Wall Wilson, Sailing Master; Henry Brooks, First Officer; James McGary, 2nd officer; Amos Bonsall, 3rd officer; Dr. J. J. Hayes, Surgeon; Christian Ohlsen, carpenter; August Sontag, astronomer; Henry Goodfellow, assistant astronomer; William Morton, steward; Peter Shepherd cook; Geo. Stephenson, J. T. Parker, Geo. J. Whittel, Wm. E. Godfrey, Geo. Reilley, and C. Blake, seamen.

After losing thirteen more men than comprised the whole expedition, according to the spiritual letter, it is really refreshing to find that Dr. Kane has still some more left.

The above communication is about on a par with all the others we have read purporting to come from the spirit world, through the modern medium system.

The New England *Spiritualist* puts on record a *test* communication received from the spirit-world, on the 30th, two days after the above, and on the same subject. It says:

"Dr. Kane has recently passed away from the earth life; his mortal body having been crushed by the ice, as he went after his crew who had gone in search of land. His ships had been broken to pieces and destroyed, and most, if not all of his crew are in the spirit-world. The spirit also stated that he in company with Dr. Kane, Sir John Franklin and others, was last night in the polar regions, and saw the remains of Dr. Kane upon the ice, with clothes, papers, and his watch, upon which they saw his name, 'Dr. Kane,' he having engraved it thereon, not expecting to escape, but hoped that it might possibly be found by some one in search of him."

It will be seen that this completely contradicts the above letter: the one says that Sir John Franklin and Dr. Kane are alive, and will soon arrive in New York; the other says they are both dead. "Oh, tantalizing spirits!"

Induced Electricity—New Developments.

In a recent lecture, at the Royal Institution, London, Prof. Faraday explained the action of Ruhmkorff's apparatus, by which the effects of induced electricity are most strikingly exhibited. Mr. Ruhmkorff is a philosophical instrument maker at Paris, who has contrived, by the application of well known principles, and by a new combination and enlargement of the induction coil, to produce from voltaic electricity some of the beautiful effects of the electricity excited by the most powerful machines; and thus to show most clearly the identity of the force excited by friction and by chemical action. The apparatus consists of a primary coil of copper wire, round which there is wound a large quantity of finer covered wire; and by sending a voltaic current through the first coil, electricity is induced in the second, though no portion of the voltaic current passes through it. This "secondary current," as it is called, possesses an intensity resembling that excited by the electrical machine. The induction of an intensity current in a second wire was discovered 20 years ago by Prof. Faraday, who exhibited on the lecture table the original apparatus by means of which that effect was produced. The induced electricity perceived on making contact with the voltaic battery is of the opposite kind to that excited on breaking contact, and Prof. Faraday stated that the cause of there being no observable effect excepting at the moments of making and breaking contact, was that the two opposing currents being equal in force, they neutralised each other. By a mechanical arrangement, which those who are acquainted with a common medical coil apparatus will understand, the contact is made and broken automatically with immense rapidity, and by this means the two electricities of the secondary current are separately brought into action. Ruhmkorff's apparatus is indeed liltle more than a greatly enlarged medical coil machine. The flood of electricity developed by this apparatus was exhibited in many beautiful experiments. When a jar, coated inside with tinfoil, was placed within the exhausted receiver of an air-pump, and one end of the second wire was connected with the inside of the jar and the other end with the metal plate of the pump, there was a copious outpouring of purple light from the interior of the jar, accompanied by concentrated electric flashes, which varied in intensity as the strength of the voltaic battery was increased or diminished. Another remarkable exhibition of this condition of electric force was its passage in a succession of sparks between the ends of two wires. The sparks succeeded each other so rapidly as to be not separately distinguishable when the wires were stationary, but on moving them about each spark was distinctly visible; the optical effect, in consequence of the short duration of the electric spark, being the reverse of that when a continuous light is in motion. Various modifications of Ruhmkorff's coil have been made by Mr. Grove and others, to increase its intensity effects, and to make the kind of electricity evolved approach still more closely to that excited by friction. In one of the arrangements shown by Prof. Faraday, in which the secondary wire was connected with the interior of a Leyden jar, the positive and negative electricities of the secondary current were exhibited separately, and producing different effects; one being intensified by passing through the jar, and the other being in its ordinary condition. The sparks emitted by the intensified current were much more brilliant, and made a louder sound than the other, and the actions of the two currents were also different; for the former pierced holes through paper, whilst the latter set the paper on fire, and the ordinary current ignited gunpowder, which the other merely threw aside. Prof. Faraday observed, in conclusion, that the extraordinary phenomena exhibited by Ruhmkorff's apparatus opened new fields for discovery, which, if he were a younger man, he should have eagerly investigated, and he trusted that others who had their minds directed to the subject would be able to elicit by the observation of those phenomena many important truths in electric science.

Precipitating Metals from the Human System by Galvanism.

We have seen accounts, in a number of our exchanges, of a discovery recently made in Paris, whereby mercury, lead and arsenic had been extracted from the human system by an electric current, the patient having been set in a bath during the operation. The editor of the *Columbus* (Ohio) *Journal* also states that he lately witnessed the same operation successfully performed on Jacob Hymrod, of that place, by Drs. Youman and Seltzer, but he describes the operation so unscientifically, that we must say the effects could not be produced as he has described them. The first, to our knowledge, who applied the galvanic fluid to extract metals from the human system, was Prof. Vergnes, of this city, whose electro-magnetic engine was illustrated on page 184, vol. 9, SCIENTIFIC AMERICAN, and who has contributed some very profound articles on electro-magnetism to our columns. He extracted silver from his own system, by the galvanic pile, in 1852, he having seriously injured his hands by the use of the nitrate of silver, in gilding by the electrotype process.

The past week has been the hottest of the season: during four days the thermometer rose as high as 94° in the shade. Prof. Merriam, of Brooklyn, sets it down as a very "Hot Term."

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New Inventions.

Lumber Slitting Gauge.

The accompanying figures represent an improved gauge for slitting lumber, for which a patent was granted to Francis P. Hart, of Chandlersville, Pa., on the 15th of May last.

Fig. 1 is a longitudinal outside view of the improved gauge. Fig. 2 is a longitudinal section of it, and fig. 3 is a longitudinal outside view, showing a different side of fig. 1. Similar letters refer to like parts.

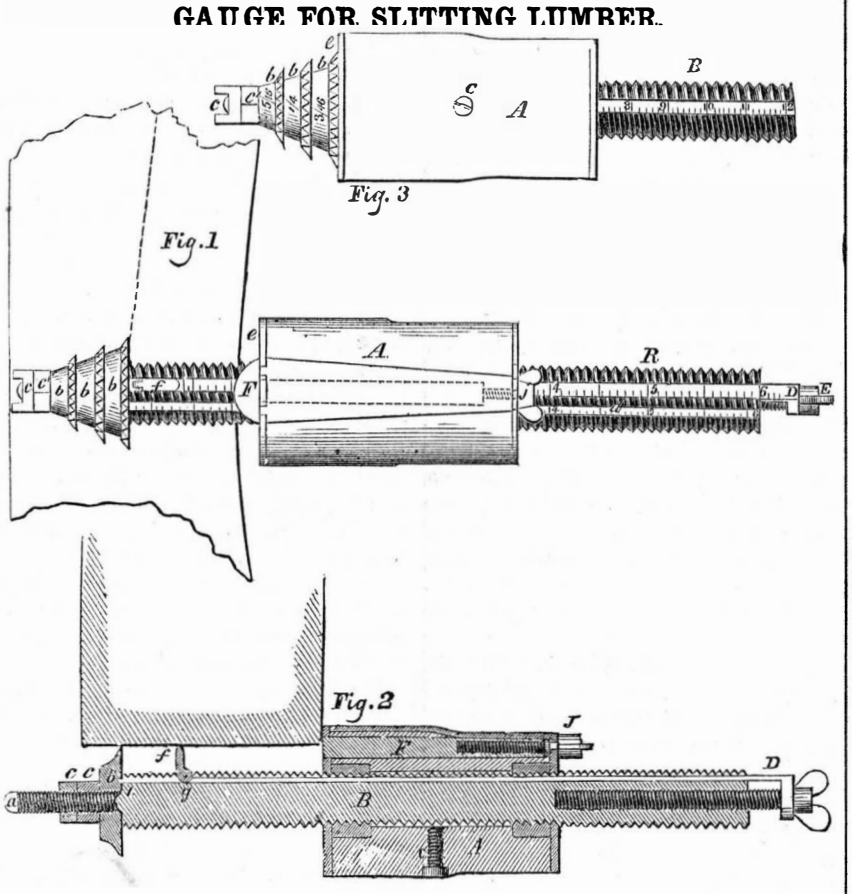
This invention consists in a contrivance for gauging in an oblique direction relatively to a given edge, so as to mark off strips of tapering form; also in a certain arrangement of one or two scribers employed for cutting mortices, whereby it may be rendered inoperative when the gauge is used for scribing a single line; and also a sliding guide piece to be brought into use for gauging curves, circles, and irregular forms.

A is the stock of the gauge which has a left screw in each end to receive and fit a fine threaded right screw, which extends nearly along the whole length of the shaft, B, and is also furnished with a binding screw, C, by which to secure it at any point on the shaft. The shaft has a pin, *a*, turned down at one end to receive one of a number of wheels, *b b*, which have sharp pointed teeth on their peripheries. These wheels are confined to the pin by a screw on the pin, and two nuts, *c c'*, and may be either allowed to run loosely on the pin, or be clamped tight up to a shoulder on the shaft at the back of the pin, according to the purpose for which the gauge is to be used. In gauging obliquely for articles of tapering form, the wheel, *b*, which is placed on the pin, is clamped by the nuts, *c c'*, tight up to the shoulder, *i*, on the shaft, and the binding screw, C, in the stock, is loosened to allow the screw to turn in the stock. The shaft is adjusted in the stock by a scale, *d*, fig. 1, of inches or other equal parts, which commences at the shoulder, *i*, of the shaft, and in order to bring the teeth of the wheel, *b*, at a distance from the face, *e*, of the stock, corresponding with the width of one end of the strip or article to be gauged. The gauge is then run along the stuff in the same way as a common gauge, and the wheel receiving rotary motion through the bite of its teeth on the stuff as it runs along it, turns the screw, and according to the direction of its revolution, either increases or diminishes the distance between the wheel and the face of the stock, thus running and scribing obliquely to the guiding edge. By changing the size of the wheel, *b*, the taper may be greater or less, according as the wheel is smaller or larger. In gauging parallel, the wheel, *b*, is left free by the nuts, *c c'*, to turn easily; and the stock and shaft are secured together by the binding screw, C. For the purpose of gauging mortices, the gauge has a slider, D, fitted to a groove in its shaft, said slider carrying a scriber, *f*, which is hinged to it, so as to be capable, when not required for use, of being folded down to be received within the groove in the shaft, as shown in dotted outline fig. 1. When thrown outwards, the scriber, *f*, is kept at a right angle to the shaft by a square shoulder at *g*, fig. 2, and when cutting, is kept up to that position by reason of its edge being beveled on the opposite side to the shoulder. The outer face of the slider, D, has a scale of inches or equal parts, like that on the scale, *d*, on the shaft of the gauge, and it is adjusted by means of a screw, E, passing through a loop at its end, and working in a female screw in the opposite end of the shaft to where the wheels, C, are fitted. For gauging both sides of a mortise, the scale, *d*, on the shaft and the scale on the slider, D, enable the scriber, *f*, to be adjusted by the screw, E, with accuracy, at a distance from the edge of the wheel, *b*, equal to the required width of the mortise, and the stock is adjusted on the shaft to bring its face to a distance from the edge of the scriber equal to the required distance from the edge of the stuff. The toothed edge of the wheel scribes one side, and the scriber, *f*, the other side of the mortise. The toothed edge prevents the gauge following the grain of the wood. F is the sliding guide piece to be employed in gauging from a circular curved or irregular edge, consisting of a flat piece of metal fitted in a slot, made in the stock parallel with the shaft, and adjustable lengthwise by a screw, *j*, at the back. The front end is of rounded form as shown in fig. 1.—In gauging straight work, the guide piece, F, is all drawn into the stock by means of the screw, *j*, and the face of the stock serves as the guide; but for gauging circular, curved, or irregular work, the guide piece is screwed out beyond the face, and its rounded end forms the bearing, and allows the gauge to follow the sinuosities of any curved or irregular edge. This instrument will be useful for saddlers, or other workers in leather, as well as workers in wood. As a gauge for cutting leather, a sharp edge rotary cutter may be substituted for the toothed wheel, *b*

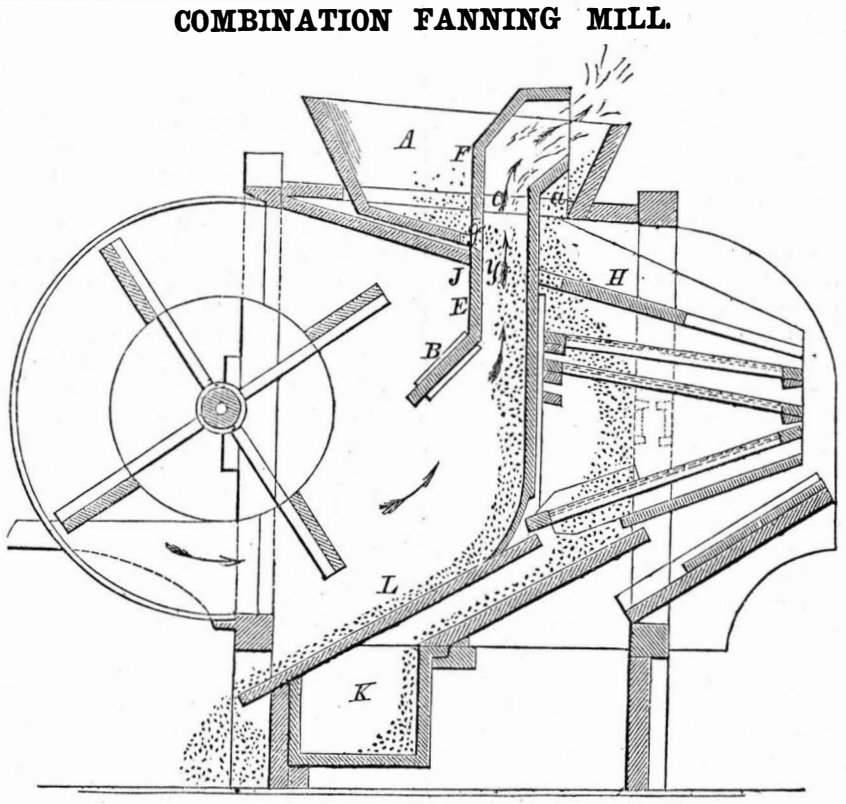
The wheels, slide, and scriber can be employed to common mortising gauges, and thus make them far more useful and convenient.

More information may be obtained by letter addressed to the patentee at Chandlersville.

GAUGE FOR SLITTING LUMBER.



COMBINATION FANNING MILL.



The annexed figure is a vertical section of the combination fanning mill, for which a patent was granted to Joseph Keech and Stephen Stilwell, on the 29th of June last. The nature of the improvement consists in an arrangement whereby the horizontal open blast winnowing machine may be converted into a vertical blast separator, for more effectually separating lighter foreign substances than the grain.

A is the hopper, and C is a vertical trunk inserted in a common winnowing machine, so as to intercept the horizontal blast, and turn its course in a vertical direction, as shown by the arrows. B is a stationary plate, which serves as a guide to direct the current of air into the trunk. E is a plate forming part of trunk C, and joining the upper edge of B. Between plate E and plate F there is an aperture, *g*, to allow the grain to pass from the hopper, A, into trunk C. This aperture may be closed by a valve The hopper is provided with recesses, *a*, through which the trunk, C, passes; but when the machine is used as an open blast, or ordinary winnowing machine, these recesses are closed by slide pieces. The figure shows the machine converted from a common horizontal fanning mill into the vertical blast mill. The trunk, C, is slid down to plate, L, and the opening, *g*, comes in a range with the upper surface of plate J. The grain at *y* is passing into the trunk, and is subjected to the vertical blast shown by the arrows. This forces all the substances that are lighter than the pure grain out. The light grain is shown forced out of the mouth of the trunk, C, into the back part of hopper, A, and it falls thence directly down upon the screens, and is carried down to plate L, and falls into the box, K.

The claim of this patent is for the movable trunk, C, for the purpose of converting the open horizontal blast of the ordinary winnowing machine into the vertical blast.

This machine, as will be seen, combines good devices for cleaning and separating grain and grass seeds, operating in the capacity of a chaffing, screening and fanning mill, and embraces very important advantages. And, in addition to the uses to which the open fan blast mill can be applied in cleaning grain or grass seeds, this mill separates the grain or seeds according to their specific gravity or weight in the vertical trunk, by means of the blast produced by the fan, as shown, by which any farmer can judge for himself of its advantages and value. More information may be obtained by letter addressed to Ebert Taylor, Waterloo, Seneca Co., N. Y., (the agent of the patentees.)

Scientific Notes and Queries.

An Ancient Museum Destroyed—The late accounts from the Crimea bring intelligence of the destruction of an ancient museum at Kertch, by the hangers-on of the allied army which captured the place. The museum was a temple containing finely sculptured ancient sarcophagia, statues, and golden ornaments. The Russians always kept a guard over it, but it seems that when it was captured by the Allies, they neglected to do this, and the army of loafers, alias *Vandals*, entered it, and committed wanton havoc on these ancient relics. This, at least, has been reported.

It is highly creditable to George Sumner, of Massachusetts—brother of the Senator—now in London, and who has traveled extensively in Russia, that he sent a letter to Sir Charles Wood, describing the value of this museum, and requested that the government would telegraph with all despatch to place a guard over the temple. This was done, but we regret to state too late to effect the object.

The Newfoundland Submarine Cable—The telegraph submarine cable to be laid down in the Gulf of St. Lawrence, between Newfoundland and this continent, and to form part of the line from New York to Europe, was shipped from London on the 28th of last month. It is expected that the whole line from this city to St. John's, will be in working order in six weeks, and that news will be received from Europe in six days.

Bonelli's Locomotive Telegraph—This telegraph, which has already been mentioned in our columns as having been successful on the Turin road, in Italy, and that messages had been transmitted to and from a locomotive running at full speed, consists in having a metal insulated rod of iron laid parallel between the rails, and a double wire trailing on it from the battery in the locomotive.

A Meteoric Stone in a Queer Place—There has been placed in the Museum of Economic Geology, London, a part of the trunk of a tree felled in Battersea Fields, in which was found a large meteoric stone which seems to have fallen on the tree many years ago, and imbedded itself deeply. The *Gardener's Chronicle* says, "It is a prodigious curiosity."

Large Trees—Until within a few years there stood near the junction of the Scantic and Connecticut rivers, in the town of East Windsor, a large sycamore or buttonwood. After the tree had partly decayed, and a shell of wood, perhaps two inches thick on the outside, remained, Mr. John Pelton found that a pole twelve feet long could be placed horizontally inside of the shell, making the tree more than thirty-six feet in circumference. Another tree near measured twenty-four feet. These trees stood near where the first English settlers in Connecticlt located.—[N. Y. Tribune.

[The California tree now in the N. Y. Crystal Palace is three times larger than this one.

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Scientific American.

NEW YORK, JULY 28, 1855.

Reaping Machine Trials.

It is our opinion that there is not a better mode of testing the principles of construction, and the quality of workmanship embraced in Harvesting Machines, than fair honest public matches, where prizes are offered for the best. But here lies the difficulty, viz., carrying out the intent of such trials fairly, and deciding justly on the merits and defects of each machine. In a recent number we published the report of the committee relating to the trial of mowing machines at Bedford, Westchester county; and if we are to credit the information we have received, (and it appears to be beyond a dispute correct,) that report of the trial was not only exceedingly defective, but incorrect. We find an article in the Batavia (N. Y.) *Advocate* relating to this trial, by a farmer who was an eye witness, who states that every machine on the ground, excepting Ketchum's, did clog repeatedly, while the report does not mention this, but classes it with three others, as being, like them, "least likely to clog." He also states that he was surprised that the committee gave the preference to Allen and Russell's machines for working on rough uncleared bottom, when it was notorious that Ketchum's machine operated better than the others.

At the end of the report of the committee, we stated that it was very unsatisfactory. It was too general, vague, and undiscriminating, and we, for this reason, judged it was the product of an incapable committee. It states that "on account of the finger caps reaching back to the finger board on Ketchum's, Manny's and Hallenbeck's mowers, these are the least likely to clog." It also states that "the machines having an iron cutter bar, cut the grass smoothest;" but with respect to the particular description of the machines, and wherein they differ from one another, it is decidedly defective. What does the report mean by the cap fingers not extending back to the finger boards? To us it appears to be Hussey's fingers; and if so, this should have been stated in the report. "Honor to whom honor is due." The machine of Mr. Hallenbeck, of Albany, got considerable praise, but did it get all it deserved? Hallenbeck first introduced the iron finger bar, and the open fingers. These things should have been stated in the report. Correct reports of such trials would be of great use to our farmers, but we must say that little reliance can be placed in any report of the kind we have yet seen. On this account, however, we will not say a word against such trials, for the ardor of the makers of such machines to come off successful in such contests, spurs them up to construct them in the most superior manner, and thus they have been led to introduce many improvements, both in the workmanship and in the arrangement of their several parts. We object in such trials to one man having more than one machine on trial, unless all have an equal number; for if one has two or three machines, and another only one—as was the case at the Bedford trial—it is natural to suppose that he who has only one will be more cautious in operating it, for fear of a mishap, than him who can remedy a breakdown to one of his machines by bringing in another to supply its place.

It gives us no small amount of pleasure to perceive the great improvement which has recently been made in such machines. Six years since, we repeatedly pointed to the huge and clumsy reapers and mowers then in use, few of which are now to be seen. Neat iron work has taken the place of large and unsightly wooden beams and bars, and we have now mowing machines of much easier draught, and altogether superior in every respect. We do not suppose, for a moment that we are at the end of improvements in such machines yet. Perfection is difficult of attainment, but without striving it never can be reached. There is still room both for the exercise of inventive genius and mechanical skill in the construction of mowing and reaping machines.

Testimonial to the late Commissioner of Patents.

Since the announcement of the resignation of the Hon. Charles Mason, Commissioner of Patents, we have received letters from many parts of the country containing expressions of regret at his retirement from office, but coupled with words of eulogium touching his official conduct, and sentiments of esteem towards him as a man. No individual ever occupied the post with such entire satisfaction to inventors and the people at large, or vacated it amid such a general shower of complimentary remonstrances because he would no longer serve.

It has been suggested by one of our correspondents that the inventors of the country, and others, should unite in presenting to Judge Mason some sort of a testimonial, in token, not only of their appreciation of the important services he has rendered, but also as an acknowledgment of the debt of gratitude they owe him for those services. This proposal meets our unqualified approbation, and we shall gladly do all that we can to promote its accomplishment. We believe there are hundreds who will take personal pleasure in contributing for so worthy a purpose, and we presume that the mere announcement of the opportunity, will be all that is necessary to ensure a very substantial and gratifying result.

It has appeared to us that no place could be selected more convenient for the deposite of contributions than Washington; and that no person more willing or better qualified to receive the funds, purchase, inscribe, and present the testimonial, could be chosen than S. T. Shugert, Esq., Acting-Commissioner of Patents.

We therefore take the liberty, without having had consultation with him, to propose and request that all persons who desire to contribute to the "Mason Testimonial," shall enclose by mail, or otherwise, the amount of their subscriptions, and address the same to "S T. Shugert, Acting-Commissioner of Patents, Washington, D. C." We further propose that the opportunity of subscribing to this fund shall be continued from the present time until the first of October next, and that the treasurer shall then expend the moneys he may have received, in the purchase of a service of plate—or whatever article may, in his judgment, be deemed more appropriate—the same to be suitably inscribed, and presented by him, on behalf of the contributors, to the Hon. Charles Mason.

In order to avoid inconvenience as far as possible, we shall request from Mr. Shugert, for publication in our paper, a list of the names of all contributors as fast as received. This publication, we presume, will be a sufficient acknowledgement of the safe receipt of the money, while it will also serve to show the progress and amount of the contribution.

We would remind our readers that it will require but a mere trifle from each of them to make up a handsome amount of money for the proposed object. We therefore hope that none will be backward about contributing because their amounts are small; "every little" will certainly help.

Death of an Inventor.

We are sorry to be compelled to chronicle the decease of John Gorrie, M. D., at Apalachicola, Fla., June 29th. Dr. Gorrie was an inventor of considerable note, his last and greatest work being the production of a steam ice making machine. A year or two previous to his decease, Dr. Gorrie had associated himself with a gentleman of fortune in this city, and they jointly undertook the construction of one of the machines on a large scale. Just as the apparatus was completed, Dr. Gorrie's partner died, and the mechanism fell into other hands, and was sold at auction. We saw it not long since at a foundry in this city. It consisted of a series of air pumps ingeniously arranged to condense air and reduce the temperature of the water, by passing it in showers through the condensers during the process of condenation. The motive power was an engine of some 30-horse power; and the estimated quantity of ice which the machine was capable of producing was two tuns per diem. The principles upon which this invention operated were described by us a long time since.

Mowing Machines—Disputed Points.

New Jersey Match—A trial of mowing machines took place under the superintendence of the New Jersey State Agricultural Society, on the 9th inst., between Newark and Elizabethtown, on the farm of O. Meeker. Seven machines took part in the contest, namely: Allen's, Deitz's, and Dunham's, Whitenach's, Manny's, Ketchum's, and Forbush's. The trial is stated to have been very satisfactory, but we have not yet received the official report of the Committee. A great number of spectators were on the ground to witness it. The *Tribune* says respecting it:—"This trial indicates a very evident progress of improvement in New Jersey. We doubt whether ten persons would have come to see such an exhibition ten years ago, and if they had seen the machines at work, they would have been very slow to profit by the improvement, as in fact the whole country has been; for mowing and reaping machines are no new things, as all well know who remember how perseveringly Obed Hussey, of Baltimore, the original inventor and builder in America, has struggled along in poverty, till he has so far perfected his machines that others have come forward when his patent expired and made some trifling addition, and with the public mind ready to adopt such great labor-saving implements on the farm, they have reaped the harvest from the fields which Mr. Hussey had sown nearly twenty years ago."

This is a left handed compliment to little New Jersey. In some things it may be behind other States, bnt in some things we venture to assert that it is much in advance of others—such as in the manufacture of jewelry, watch csses, &c., patent leather, &c., as carried on at Newark. Then there is a Paterson, distinguished for its locomotive and cotton machinery. New Jersey has a high reputation for some kinds of manufactures, and the *Tribune* makes a great mistake when it stigmatizes its people for backwardness in reaping machine inventions, and gives all the credit to Obed Hussey, of Baltimore, for being the original and first inventor of them. New Jersey was the first State which distinguished itself for reaping machine improvements; the first American reaping machine patent having been taken out in 1803, by R. French and J. T. Hawkins, two of her citizens, and the machine of Wm. Manning, of Plainfield, N. J., patented in 1831, with the exception of the top guards for the cutters, was the same as the most approved of the present day—it was the parent of all the successful American mowing machines. "Honor to whom honor is due."

Has McCormick Invented Anything?—This is a question forced upon us by a letter from Messrs. Seymour and Morgan, of Brockport, N. Y. In it, it is stated that he is not the inventor of the zig zag side edged cutter, that "he claims the straight edged sickle teeth reversed every 1½ inches, in order to cut both ways. And we again repeat that Moore & Haskell first invented the straight sickle above described (some ten years before the date of McCormick's patent,) afterwards the zig zag sickle."

Rochester Trial of Reapers—The account which we published in No. 44, taken (as stated) from the Rochester *American*, respecting the trial of reapers, is stated to have been very incorrect in a card published by Howard & Co., of Buffalo, in the *Rural New Yorker*. The report of the Committee on the trial has been published. The first premium was awarded to Ketchum's, the second to Manny's with Wood's improvements, and the third to Wheeler's. The report of the Committee is totally worthless so far as it relates to the construction of the machines. It states that "they had no time to examine minutely their mechanical construction."

What a confession for a committee appointed to decide on the merits of these machines.

Exhibition of the Maryland Mechanics' Institute.

The eighth annual exhibition of the Maryland Institute for the promotion of the mechanic arts, will be held in the city of Baltimore on the 2nd of October next. The mechanics, artists, and manufacturers of the different States are invited to become exhibitors. The prizes are as follows:—One hundred dollars will be given for the best specimen of machinery; seventy-five for the best article the production of a mechanic or manufacturer, not included in the machine department; fifty for the best work of art; and twenty-five for the best specimen of ladies' needle, crochet, or knit work. These are extra prizes to the usual gold and silver medals. The Baltimore exhibitions have always been highly distinguished for display, spirit, and good management. We hope this one will be well attended as it deserves to be.

The Maryland Institute is the most complete and imposing in our country. It possesses a splendid and large building, has a School of Design, one of Applied Chemistry, and a regular winter course of lectures.

Big Spring Fair.

The second annual fair of the Big Spring Literary Institute, will be held at Newville, Cumberland Co., Pa., on the 7th of August (next month.) This Institute has for its object the encouragement of agricultural, mechanical, and the other useful arts. The exhibition will be held in the hall of the Institute at Newville.

Information respecting the exhibition of articles may be obtained by letter addressed to the President, John Diller, or Cor. Secy., W. R. Linn.

Beautiful Lithographic Work.

We have had the pleasure of examining some beautiful colored lithographic plates (representing varieties of fungi,) produced in Vienna, the place where the art was discovered, and which has been presented to the American Institute by Chas. F. Losey Esq., Austrian Consul in this city. These works of lithographic art afford abundant evidence of the great taste and skill of the Austrian artists, and that the mother city of this invention still maintains her superiority

We are also indebted to Mr. Losey for a copy of the Transactions of the Austrian Association of Engineers at Vienna. This work is published twice a month, and shows us that in some things the Austrian engineers are ahead of ours, for the American Association of Engineers which was formed in this State a few years ago, has now no existence, and only published two short papers of its transactions.

How to Increase the Speed of Steam Vessels.

What is to prevent the paddles being affixed to chain cables passed over two wheels, one at each end of the boat? This would be equal, in fact, for practical purposes, to a paddle wheel of any desired diameter—one to which the motive power might be applied from two or more shafts, accomplishing a greater number of revolutions, and hence increasing the speed to almost any desired extent.—[Phila. Ledger.

Our cotemporary will find such a method of propelling vessels illustrated in our history, on page 152, vol. 5, Scientific American, invented by a distinguished Philadelphian, the partner of John Fitch. It is not a good plan, however, because it involves such an amount of loss by friction,

The Water of Albany.

We learn by the Albany *Knickerbocker*, that the water of Albany, at the present time, is in the same state that the Boston water was last year—it has got the fishy taste. The *Knickerbocker* calls for chemical analysis to unravel the mystery. That has been done with respect to the Boston water already, and accounts of the same will be found by our cotemporary in back numbers of the present Vol. Scientific American.

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Foreign Editorial Correspondence.—No. 8.

Paris Exhibition, &c.

PARIS, June 28, 1855.

As every country has its distinguishing marks, not only in the habits and customs of its people, but also in the labors they perform, it will be no more than just to award to France the first place in the field of practical and analytical chemistry. Art of almost every description is practiced in greater perfection in France than in any other country, and the labor of her eminent savans, Lavoisier, Guy Lussac, Chaptal, Dumas, and others, justly entitle her to the first consideration in this respect.

In the Palace of Industry, England comes forward with her solid and useful machinery, —iron, cutlery, tissues, and engravings. Germany with her arms, porcelain, musical and mathematical instruments, lace, and embroideries; and other countries with less productive power exhibit well chosen trophies of their respective branches of industry. The only exception to this is Russia; she has chosen to isolate herself from this peaceful association, and throw all her vast strength into the tide of disastrous war. France, from its brilliant capital, gives impulse to fashion, by sending forth a complete invoice of unsurpassed fabrics, whose perfection is dependent upon chemical science; this is her foundation; take it away, and down tumbles her well-earned fame as a producing country. The success of France in this department is, in a great measure, due to the encouragement given to art by its government, and it seems a mystery that so little thought has hitherto been bestowed upon the science of agriculture. It is really painful to look upon the ancient notions that so generally prevail in this important branch.

In the Exhibition, the glass and crystal works of France are superior to those exhibited by any other country, and throughout there are abundant examples of her beautiful chemical productions on exhibition. So abundant are they, that it is out of my power to do more than glance at such points as appear just now most worthy of notice. In pharmacy and perfumery there are large displays. In these departments France has no rival; this is evidently proved by her extensive exportation of these articles throughout the whole world. The subject of greatest interest to the French people is fuel; they employ clumsy devices for burning it, and this seems the more strange from the fact that it is very scarce and high-priced.

But even with some good improvements for consuming their fuel, they also find themselves reduced to the necessity of discovering a new article of fuel itself. The progressively rising price of coal in France enforces the necessity of creating new resources, or of discovering new mines, in order to meet the necessities of the increasing industry of the country. This result seems to be almost if not entirely gained, if I may judge from the beautiful specimens of artificial fuel displayed in the Exhibition. This artificial coal is made of the dust of several different kinds of refuse wood, agglutinated by the tar produced from gas manufactures, and then carbonized. The result of this process seems, from experiments, to offer a fuel at a moderate price that gives regular combustion, and also a constant and uniform heat. The specimens of this new fuel are excellent, and there is no doubt but that the waste gases from manufactories, and also the refuse particles of wood, may be made to supply a very good fuel—limited of course in its amount.

I shall now speak of a trade offering greater results—the turf; numerous specimens of which are on exhibition. Turf for fuel is found in the central part of Europe. Its formation is, I dare say, cotemporary, and daily taking place. It is a compound of aquatic mosses, and is the only fuel of the central part of Germany, Spain, and Italy, and these countries will profit largely from the labors of French chemists in rendering it an article of still greater value and importance to them.

These mosses, when dryed and carbonized, afford an excellent fuel for the working of iron, steel, cast iron, and various other metals. This is well known, but it is only lately that attempts at the distillation of the fuel have been crowned with success. By the recently invented process of Morceau and D'harcourt for the distillation of turf, the following products are obtained:

First, a gas giving a purer light than is obtained from coal.

Second, a substance resembling stearine, which gives not only more light, but it is also more pure and transparent than stearine. The beautiful molded specimens on exhibition have the appearance of the most refined wax candles. So far as regards the process, I know but little of its practical economy, but I am informed that it is satisfactory. France and England exhibit specimens of excellent tar oil. It is extracted by distillation from bituminous schists and asphaltic limestone (schistous clays,) from the secondary grounds adjoining the coal mines. These bituminous schists are remarkably rich in Wales, and when purified by distillation, they produce a kind of paraffine used for glazing and whitening stearine candles. The paraffine, however, is not the only new fatty product that serves the wax candle manufactories of France. They have lately extracted from a plant called the *ricin*, an oil that is found to be very useful in this branch of business, as it possesses the properties of paraffine, and serves the same purpose. To this new product is joined a new caprolic alcohol, which is at present a product of the laboratory. I do not know if this plant grows in our country, but it is plentiful in South America and Cuba.

I notice in a late number of the SCIENTIFIC AMERICAN, a brief extract about a new metal lately discovered here. The subject attracts considerable attention, and from representations made to the Emperor respecting its importance, he granted out of his private purse the sum of $6,000 to the young chemist, Deville, the inventor, to assist him in perfecting it. This new metal is called aluminum, and until now it has been obtained with the greatest difficulty. It has the properties of copper, platina, and silver, and is insulated from clay. It is almost proof against the most concentrated azotic and sulphuric acids, and is white, fusible, ductile, and unoxydizable in open air. It is obtained by a re-action of sodium on chloride of aluminum, the aluminum remaining insulated. Some articles of jewelry have already been manufactured out of it, and it has also been used for the electric battery, instead of platina, and in this last application it produces a more intense, regular, and continuous current. The most practical minds of the European continent anticipate many useful applications of this metal, owing to the abundance of silicates of aluminum, as it will give rise to a great trade, and afford a new element to the workman and artists. S. H. W.

Paine's Electric Engine.

MESSRS. EDITORS—A number of your readers have written to me on the subject of my electro-magnetic engine, making inquiries respecting its peculiarities, and as I perceive by some remarks of your own on the subject that you have been misinformed as to its nature, I send you the following:

The engine lately on exhibition in this city was not constructed for the purpose of a motor, but as a magnetic electric machine intended to generate currents for electrical experiments. When, however, it was placed in a battery circuit, it exhibited sufficient motive force to render it a machine of great interest. The elements which composed the apparatus were thirty permanent magnets, weighing eleven pounds each, and thirty helices of No. 17 wire, weighing four pounds each. The mean attractive and repulsive force of each helix was twenty pounds under a velocity of 2600 feet per minute. The diameter of helix wheel is 35 inches, and weight of periphery and helices 260 lbs. In seven seconds of time the wheel attains a velocity of 309 revolutions, and the reversing of the battery current brings it to a dead rest in seven seconds. The battery force employed was 6 cups, Grove's arrangement, of 9 square inches of platinum, and the duration of such force ranged from seven to eleven hours.

You will perceive, on comparing the above statement with the report of Prof. Mapes on the Page engine, that I have arrived at a result with 54 inches of platinum that could not be attained by the Page engine with a battery of 10,000 square inches, one hundred cups of 100 square inches each only giving 6·84 horse power.

Some of the mechanical details and general configuration of the engine are like other electro-magnetic rotary engines, but the position of the polar curves and management of the currents are entirely dissimilar to any experiment now on record. While the engine is in motion, the circuit is never broken, and consequently there are no secondary currents, or waste discharges, due to the breaks of pole changers. The method of acquiring these results is the patentable feature of the engine, and should not now be made public, it being at present a subject of foreign application for letters patent.

Your correspondent, W. W. Bennett, mentions the use of electro magnets in Prof. Hall's engine as superior to that of permanent magnets. Of course when their comparative individual powers are considered, the electro magnet is many times the superior, but when we consider the result of their combined action, we must decide in favor of the permanent magnet, simply because the permanent magnet becomes, by induction, as the electro magnet approaches, as powerful as the electro magnet itself, and consequently the use of battery force to sustain one set of magnets, is not required. To secure such action, however, the polar arrangement of the permanent magnets must be different from that of electro magnets in their place, and this difference is what gives my engine a part of its great gain over other machines of its kind.

I am now engaged in constructing an engine of fifty-horse power for the rails, and if it fails of success, it will not be because of any difficulty heretofore met with by experiments, but from some new obstacle, which, in its turn, must and will be overcome.

H. M. PAINE.

Worcester, July 10, 1855.

[Here we are told that his machine is composed of thirty permanent magnets and thirty electro magnets, and that there is both attraction and repulsion amounting to 20 lbs., manifested in each electro magnet moving at a velocity of 2600 feet per minute, and the circuit never broken. We cannot conceive how both attraction and repulsion can be manifested at the same time, by the same electro magnet and under the same conditions, as plainly stated in this letter. Permanent magnets are unsuited for producing motion in a machine; ten thousand of them would not make Mr. Paine's electric engine revolve, yet, by some hocus pocus, while he admits that singly they are inferior to electro magnets, he asserts they are collectively superior—thus rivaling the famous centrifugal force engine, by obtaining a power "coming from nothing and costing nothing." His engine, by his own figures, exercises about 1·57 horse power, but this, no doubt, is exaggerated, as the 20 lbs. of attraction and repulsion mentioned is something hypothetical. We venture the assertion, that when he gets his fifty-horse power locomotive on the rails (if ever he does,) that it will easily be beat by a steam locomotive that will not cost half as much to construct or maintain in working order.

The Economy of Mowing Machines.

Now let us compare a little the two modes of cutting grass. Day laborers, hired at $1 per day, will probably mow in medium grass 1½ acres to the hand; that is, it will cost $5 or $6 to mow 8 acres, and 25 cents each hand for boarding will be $1,50 more, which, added to $5,50 makes $7 for mowing 8 acres. Now hire a man with a span of horses and a machine to cut the 8 acres, at 50 cents per acre, and he will cut it in a day—$4, and $1 more will pay their boarding, making in all $5, and the grass will be spread better for curing than a man will spread it after the 5 hands, which, in the estimate, will make $3 advantage to the mower. At that rate, the machine will pay for itself in 40 days mowing, besides saving so much hard labor.—[Jos. Mosher, in Ohio Farmer.

Steam Boilers—Saving of Fuel.

MESSRS. EDITORS—I observed your article in the SCIENTIFIC AMERICAN of June 16, on the subject of steam, and am induced to write you a few lines on the subject. The great majority of the boilers now used in this section are the common flue boilers, which, on account of their strength, are preferred generally to the low pressure boilers, which are very expensive in their fabrication. Some years of experience and study have satisfied me that very long boilers are not the most effective, as the fire dies out; and where it ceases to be efficient to make water boil, the balance of the space through which it passes is useless, and in some degree a positive evil, as it must act as a condenser to that part of the boiler where the steam is generated.

In using flue boilers we commence firing underneath, and it cannot escape your observation that one half of our fire is lost on the brick bed which, by its reflective action, returns back but a small portion of that which it receives; some writers say one-fourth; some say one-eighth; the balance must be a dead loss. Thus in the outset, it will be observed that we lose one-half, or nearly so, of the benefit of our fuel.

Now, if we are to continue to use flue boilers, it becomes a matter of the most serious inquiry as to which plan is the best, so to arrange them as to economize our fuel to the greatest advantage. About eighteen months since I erected a boiler after the plan known as Bird's patent, which will be found illustrated in the SCIENTIFIC AMERICAN of Sept. 23, 1854, by which you will observe that one boiler is placed directly above the other. The lower boiler in this case serves for the fire bed, and receives the heat as it first radiates from the furnace. By this means the fuel used for one boiler is made to subserve the purposes of heating two, and a corresponding degree of fuel saved, say one half, while double the amount is now daily expended in heating two or more boilers placed side by side, while one half will be amply sufficient for the purpose. No smoke appears above the tops of my chimneys, though not more than thirty feet high, and this I attribute to the fact that the intense draft caused by the upper and lower sets of flues causes it to be consumed in its progress. I will state what is well known in this community, viz., that I do not use more than one half the fuel generally used by those engaged in similar business, as driving a saw mill, grist mill, machine shop, &c., where the boilers are placed side by side in the usual manner. W. E. B.

Cahaba, Ala., July, 1855

The Alanthus Tree.

A great outcry has again been raised this season against the above tree, and the New York *Times* has reiterated the old cry, "Down with the alanthus!" Before this tree is cut down in any of our streets, we hope those persons who fiercely call for its destruction will be so good as to provide a superior substitute. We do not know of any, nor has one been recommended by any of those who seem to be demented in their efforts to annihilate it. It is really the only shade tree in our cities that is proof against abominable vermin. If it has an offensive smell, for a few days, during its blossoming period, its beautiful appearance and vermin-proof character outweigh all the arguments that have been brought forward to destroy it.

Wardwell's Machine for Tennoning.

The machine of C. P. S. Wardwell, illustrated in No. 44—first page—describes it as peculiarly adapted for tennoning bedstead rails, but it is adapted for all kinds of square tennon work; this we should have mentioned, but supposed that every person understood it.

Locomotive building seems to be reviving at all the large manufactories. A firm in Paterson, N. J., has 57 orders ahead for locomotives.

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TO CORRESPONDENTS.

J. McS., of Cal.—The interest which so many Californians take in the success of the SCIENTIFIC AMERICAN, is an evidence of their superior information.

F. W., of Ohio.—We cannot understand why the engine should have more power, or go faster, cutting off at half stroke, than when receiving steam the whole stroke. It is contrary to the generally received theory; and Corliss & Nightingale's is not the only engine having a governor applied to the cut off to regulate in the manner they do. We cannot judge of the patentability of your cut-off without a drawing. If the idea we get from your description is correct, there is nothing essentially different to many others in common use.

G. F. H., of Mass.—We have not not yet seen Prof. Hall's electric engine. We were promised a sight of it some time since, but as yet the proprietors have not divulged.

W. B. G.—Your plan for sealing fruit jars is not new or patentable.

R. W. A., of Ct.—The penalty for not putting the real date of the patent upon the article, is $100 for each offence One-half goes to the government—the balance to the complainant.

C. S., of Mass.—There is nothing new in your safety car device.

W. G. G., of Pa.—Cannot say whose is the best patent for bending stuff for small boats.

E. M. G., of N. Y.—We published an engraving of a velocipede on page 369, vol. 3, SCI. AM.

G. & W., of N. C.—We think there is a chance for a patent on your sash arrangement. Send on model and government fee of $30 whenever you are ready to proceed.

J. R. A., of N. Y.—We regard your horse power as new and patentable. Send on model—also $30 government fee.

A. L., of Pa.—You cannot carry water practically much higher than 30 feet by a syphon. Theoretically, it should be about 33 feet, that being the hight of a column of water which equals the pressure of the atmosphere.

W. H., of Ill.—You would find no saving effected by using the vapor of alcohol, at the same pressure as steam. Steam can be generated at a high, as easily as at a low temperature.

L. L., of Conn.—The Engineer and Machinists' Drawing Book, by Blackie & Son, of this city, at fifty cents per number, will instruct you how to draw gears.

H. H. W., of S. C.—It affords us pleasure to pay a tribute to the zeal which the mechanics of your place have displayed for the spread of useful information.

R. G., of N. Y.—Do not despair in seeking to invent some improvement from which you can realize something handsome. Many inventors have toiled far longer than you, and under far greater disadvantages, and yet arose out of them all conquerors. Watt and Arkwright obtained wealth.

T. F., of Ky.—There is plenty of coal in Kentucky, and your State must ultimately become great for manufacturing. You have men of genius among you; let them give it free scope.

L. G. E., of Ala.—Your letters patent and letter covering $20 are both at hand. On the receipt of your model, we will advise upon the points of inquiry by mail.

F. W. B., of Vt.—We think it doubtful whether a patent could be obtained for your invention. A movable breech, substantially like yours, has been employed, operated by a lever under the stock, by which it was raised high enough to be loaded, and when loaded, lowered into its place. We are inclined to think that merely making the breech movable by hand, to substitute another one for it, would not be considered an improvement, but rather a less convenient arrangement.

H. B & O. S. W., of Ind.—Of course you cannot both make affidavit to the invention, if but one of you invented it, even if you are partners in business, and manufacture the machines together. We will alter the specification so as to have O. S. sign it, and make affidavit to it, and send an assignment making over to H. B. one undivided half of O. S.'s interest. The papers will be sent to you in a few days. Full instructions in regard to executing the papers will accompany them.

I. H. D., of N. Y.—Glue is made from the skin and sinews of animals. The process is complex, but we may describe it at some future time.

R. T., of N. J.—Your invention appears to be a good one, although the improvement is small: you no doubt can obtain a patent. If well managed, it may be very remunerative to you.

H. C., of Mass.—There is still room for improvements in potato-digging machines.

H. W. W., of Pa.—A cubic foot of water weighs sixty-two and a half pounds.

A. McS., of C. W.—Do not lose sight of agitating a good Patent Law for Canada, at the next meeting of the Parliament.

R. M. F., of N. Y.—The steamship *Arago* has oscillating cylinders.

J. K., of N. Y.—So far as we can learn, no fabrics are made in our country, nor any other, from flax cotton. It may be used in some places mixed with cotton.

O. N. T., of Conn.—You must endeavor to present your missle to the Czar. It will be a terrible instrument in the hands of those who first use it.

B. R., of Pa.—We will endeavor to give you some information about boiler incrustations in a week or two at furthest.

A. McN., of Ohio.—You cannot obtain a patent for the two processes described in your letter. You must get two patents to cover them.

W. P. P., of Md.—The British Association for the Advancement of Science meets at Glasgow, Scotland, in September next. Your paper will no doubt receive marked attention from its members; many of them are distinguished engineers.

T. L., of Mass.—We have views respecting the planets very different from those of Sir David Brewster. We are of opinion that no planet in the solar system, but our own, is inhabited.

R. J., of Va.—The cannel coal of Virginia must yet come into extensive use for making gas.

T. G., of Ohio.—You are perfectly correct respecting the SCI. AM. being always the first to bring every useful American invention before the public. It has been the means of doing a vast amount of good to inventors, and our whole country has been benefited by it. That is our opinion.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, July 21:—

A. B. G., of Ct., $30; D. T., of N. Y., $10; G. S., of Ala., $26; T. R., of N. Y., $30; C. B. B., of Ill., $25; E. G., of Mass., $25; W. L., of N. Y., $30; E B., of N. Y., $30; O.C., of N. Y., $55; W. R. C., of Tenn., $30; E. W., of N. Y., $100; E. K. B., of Ct., $25; G. C. K., of Mich., $25; T. B. of N. Y., $30; C. J. C., of Pa., $30; A. H., of N. Y., $15 T. B. D., of O., $25; R. B., of Pa., $30; J. V. H., of Ill $30; G. B. A., of Ct., $30; W. W. Van L., of N. Y., $50; E. R. B., of Ct., $30; W. W. B., of N. Y., $30; J. E., of Mass., $32; J. Q., of Ct., $25; M. & S., of N. C., $38.50; F. A., of N., Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 21:—

G. S., of Ala.; G. C. K., of Mich.; J. Q., of N. Y.; E. G., of Mass.; W. N. G., of Ct.; E. K. B., of Ct.; M. S. S., of N. C.; J. W. K., of N. H.; A. H., of N. Y.; J. B. D., of O.; C. & W., of Wis.; F. A., of N. Y.; C. B. B., of Ill.; K. H., of Ill.

Important Items.

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers, bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, bound, $2,75. Of Vol. 10, all except Nos. 17, 25, 26 27, and 28, at the subscription price.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

RECEIPTS—When money is paid at the office for subscription a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

MODELS—We are receiving almost daily, models of inventions which have not the names of their inventors marked upon them. This usually prevents us from taking any notice of them whatever. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and sometimes prevent the model from being mislaid.

PATENT LAWS, AND GUIDE TO INVENTORS—Congress having adjourned without enacting any new laws pertaining to applications for patents, we have issued a new edition of the old laws, which may be had at our counter or sent by mail. This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

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IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had TEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide-spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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American and Foreign Patent Attornies, 128 Fulton Street, New York; 32 Essex Strand, London; 29 Boulevard St. Martin, Paris: 6 Rue D'Or. Brussels

FOR SALE.—A Planing Mill, with the right to use four Woodworth Planing Machines, now in operation, and doing a good business. This is one of the very best arranged mills in the country, and will be disposed of on fair terms to a person or persons with some means. Not much money will be required, if undoubted security can be given. To parties having adequate means to add any other business to planing, as many lots will be sold or let as may be wanted. Persons wishing to purchase will please address W. P. M., box 1248, New York P. O. stating what their means are, and where an interview can be had. If not sold very shortly, one-half or the whole will be let at a fair rent. 1*

HUNTINGTON P. O, HUNTINGTON Co, PENN.
May 27th. 1855.

GENTLEMEN—I have in use one of Mr. Vandewater's Jonval Turbine Water Wheels, and have no hesitation in saying for most all water powers they surpass any wheel in use. I have tested the above wheel in a way which is not often in any one person's power to do, using the water immediately out of the tail race of the Jonval water wheel directly into the head race of the overshot mill, which has two overshot wheels, 12 feet each, and tested them three successive days, and found the two overshots to use the whole amount of the water which had been used by the turbine while the two overshots did not grind as many bushels by one-third as the Turbine did, with one run of burrs. Vandewater's new wheel is the one I would now use and purchase. I would advise a wheel for each pair of burrs. Mr. Vandewater will stand the test, if required, of his wheels. Yours, &c.

B. F BELL, of Antistown, Blair Co., Penn.
To Messrs. FISHER & MCMARTEURS. 1

LEWIS WHITE, Manufacturer of various articles of Brass and Iron, also Moucels, Moulds Dies Designs and Embossing Tools.
1* No. 10 Trumbull st., Hartford, Ct.

UNITED STATES PATENT OFFICE,
Washington, July 12. 1855.

ON THE PETITION of Benj. Tatham of New York, and Geo. N. Tatham, of Philadelphia, praying for the extension of a patent granted to them on the 11th day of October, 1841, for an improvement in machinery for making pipes or tubes of lead, tin, and other metallic substances, for seven years from the expiration of said patent, which takes place on the 11th day of October, 1855:

It is ordered that the said petition be heard at the Patent Office on Monday the 24th day of September, next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 14th day of Sept., 1855.; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Penn,; Scientific American, New York; Daily Baltimore Republican, Courier, Buffalo, and Post, Boston, Mass., once a week for three successive weeks previous to the 24th day of September next, the day of hearing. S. T SHUGERT,
Acting Commissioner of Patens.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 46 3

FOR SALE—A PORTABLE STEAM Hoisting and Pumping Engine—Suitable for loading and discharging cargoes, raising stone for buildings, steeples, &c., also for pile driving. Will raise a hammer 20 hundredweight 60 feet in 30 seconds. By A, L. ARCHAMBAULT, Portable Engine Builder, 15th street, above Willow, Philadelphia. Portable Engines for driving portable saw mills made to order. Power from 5 to 30 horse. Orders filled in three to five weeks. 45 4*

TO RAILWAY CONTRACTORS—To be Let, the clearing, grading, construction, furnishing &c, of 200 to 300 miles of railway, at very remunerative prices. None need apply but principals, and those having ample command of capital, as part of the payment will have to be taken in stock, which should not be too hastily pressed on the market. Address Z. Y. X., Office of Scientific American, Fulton street, New York. 44 tf

MILL WRIGHT AND MACHINE WORK OF every description executed with promptness, and in the most approved manner. Steam Engines from five to fifty horse power of the most substantial and economical construction. W. H. ADAMS, 29th street and 11th avenue. 44 3*

LIFE ILLUSTRATED,—A First Class Weekly Newspaper, devoted to News, Literature, Science and Art; to Entertainment, Improvement, and Progress. To encourage a spirit of hope, manliness, self-reliance; to record all signs of progress, to advocate political and industrial rights of all classes, to make it one of the BEST NEWSPAPERS IN THE WORLD. Two Dollars a year.

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FOR THREE DOLLARS, in advance, a copy of each of these three Journals will be sent one year. Address, prepaid, FOWLERS & WELLS,
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LATHES FOR BROOM HANDLES, &c.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds, Hoe handles, Fork handles, and Broom handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post-paid) MUNN & CO.,
At this Office.

1855—WOODWORTH'S PATENT Planing, Tonguing, and Grooving Machines—The subscriber is constantly manufacturing, and has now for sale the largest and best assortment of these unrivalled machines to be found in the United States. Prices from $85 to $1450. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 43 10*

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AMERICAN PLATE GLASS COMPANY—(Factory Williamsburgh L. I) are now prepared to execute orders for rough Plate Glass, suitable for floors, sky-lights, vault, and deck lights. Prompt attention will be given to orders left at their office, 412 Broadway, or their agent, J. R. PLATT, 76 Murray st. 42 8*

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MATHEMATICAL INSTRUMENTS—The undersigned furnishes, free of charge on application to all part of the United States, his new Illustrated Catalogue of Mathematical, Optical, and Philosophical Instruments. C. T. AMSLER,
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THE ARTISAN JOURNAL—A Monthly Record of the Process of Civil and Mechanical Engineering, Steam Navigation Shipbuilding, and the Industrial Arts. Chemistry, &c. Published in London and for sale in numbers and volumes by CHAS. H. HASWELL, Consulting and Superintending Engineer, Bowling Green, New York. Drawings and specifications of Steam Machinery, in all its branches, furnished upon application. 14 1amtf

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc.
CHARLES W. COPELAND,
43 eow tf Consulting Engineer, 64 Broadway

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T. H. LEAVITT, Agent and Treasurer,
41 6* No. 40 State St., Boston

THE DAILY SUN—Mail Subscribers.—The morning edition is forwarded by the early mails to country subscribers, at $4 per annum, or $1 per quarter, payable in advance. The postage under the present law is as follows:—To any Post Office in the State of New York, 78 cents per year, payable quarterly, 19½ cents, in advance. To any Post Office out of New York State, but within the United States, $1,56 per year, payable quarterly, 38 cents in advance.
MOSES S. BEACH, Publisher.
Sole Proprietor of the Sun Establishment,
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NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringemet of the Woodworth Patent.

Rights to use N. G. Norcrois's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
Office for sale of rights at 208 Broadway, New York Boston, 27 State street, and Lowell, Mass. 42 6m*

THE CHEAPEST HORSE POWER KNOWN. Patented April 1st, 1855.—Sampson's horse power has not a gear wheel about it, and it can be constructed and kept in repair by an ordinary mechanic. It costs less and furnishes a larger percentage of power than any horse power known. For the purchase of rights for the District of Columbia, Maryland, Delaware, New Jersey, Pennsylvania, New York, Ohio, and the New England States, apply to Prof. CHAS. G. PAGE, Washington, D. C. 35tf

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GRAIN MILLS—EDWARD HARRISON, of New Haven, Conn., has on hand for sale, and is constantly manufacturing to order, a great variety of his approved Flour and Grain Mills, including Bolting Machinery, Elevators, complete with Mills ready for use. Orders addressed as above to the patentee, who is the exclusive manufacturer, will be supplied with the latest improvements. Cut sent to applications, and all mills warranted to give satisfaction. 34 3m*

IMPORTANT INVENTION—Patented 7th June, 1853.—Falconer's Coupling for hose, hydrants, force pumps, etc., is the only coupling likely to supersede the screw coupling. It can be made cheaper than the screw coupling, and excels it in every respect, and after a public trial under the severest tests, it has been adopted under an Act of the Corporation of the City of Washington, for the Fire Department, in place of the screw coupling. For the purchase of rights under the patent, apply to Prof. CHAS. G, PAGE, Washington, D. C. 35tf

POWER PLANERS—Persons wanting Iron Planers of superior workmanship, and that always give satisfaction, are recommended to the New Haven Manufacturing Co., New Haven, Ct. 40tf

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LATHES, PLANERS, and all kinds of MACHINISTS' TOOLS of the best description on hand and made to order by SHRIVER & BROS., Cumberland, Md. (on Baltimore and Ohio R.R., midway between Baltimore and the Ohio River.) 43tf

ANDREWS & JESUP—Commission Merchants. Cotton and Woolen Machinery, Steam Engines, Machinists Tools, Belting, &c., Importers and Dealers in Manufacturer's Articles, No. 67 Pine st., N. Y. 23 1y

MACHINISTS' TOOLS—Manufacturers, Mechanics and Railroad Supplies, Locomotive and Stationory Engines, Steam Boilers, Belting, Cotton and Woolen Machinery, Water Wheels Pumps, Blowers, &c.
FOSTER & LEACH,
26 Broadway, N. Y., Selling Agents of the Lawrence Machine Shop. 36 13*

NEW HAVEN MFG CO—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, Address, "New Haven Manufacturing Co." New Haven, Conn. 40tf

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HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 13 tf

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Science and Art.

The Art of Dyeing.—No. 31.

BLACK ON SILK—This color is easily dyed on silk fabrics which may have been almost any other color. The common way of dyeing a good black on silk is to prepare it in a mordant of the nitrate of iron, wash it well, and dye in a liquor of logwood. The nitrate of iron is kept in a tub ready prepared, and standing in every silk dyehouse. It is made by dissolving clean iron hoops, slowly, in nitric acid, and then mixing it in a large tub with water until it stands about 2½° in the hydrometer. The silk is cleansed from gum and grease, handled carefully for ten minutes, then sunk under the liquor for two hours. It is then lifted, and rinsed in three tubs of clean cold water, and is ready to receive the logwood. The liquor of 6 lbs. of logwood, boiled for one hour, is sufficient for ten pounds of silk. Some fustic liquor (three pounds) is added, to throw the color on the jet shade. The goods are handled for about half an hour in this logwood and fustic liquor, then lifted, washed, and dried. If they should have a grayish appearance, it is a sign they want more logwood; if they have a brownish appearance, it a sign they have received too much. This latter is remedied by handling the goods in a very weak sour of diluted sulphuric acid, by which some of the logwood is stripped off. Black silks are rinsed in hot water before drying.

Another way to dye black is to make up a hot solution of copperas, a little blue vitriol, and some fustic in a boiler, and handle the goods in this for one hour. Four ounces of copperas and one-fourth of an ounce of blue vitriol, are sufficient for each pound of silk. When taken out of this preparation they should be of an olive color; they are now hung up and aired for ten minutes. A clean vessel of logwood liquor is then made up, and the goods entered at a temperature of about 80°. The heat is then increased to nearly 200°, and kept at that heat for half an hour when they should be a good color, and fit to be lifted and washed. The same signs of the want of dye, or a superabundance, as described, answer for all methods of dyeing this color, and the same treatment effects the same objects. In dye shops where wool and silk are colored, it is a common practice to prepare a batch of woolen goods, without any addition of copperas, in the same preparation as that used for a batch of silk goods; and as silk does not take up the coloring matter of the logwood so well as wool, the same liquor which has dyed a batch of silk goods is nearly of sufficient strength for dyeing a batch of woolen goods. This last is the common method of dyeing in jobbing dye-houses; the nitrate of iron process is the common method in skein dyeshops.

When black silks have a somewhat brownish appearance, they are improved in color by running them through a solution of warm soap (soap suds.) Silk pieces are dressed with a weak size of glue, and if somewhat brown in color, a little soda and sweet oil are added to the size, which greatly improves the color. Sweet milk is also used to dress black silk goods in the piece, and some prefer to slick over their surface with sweet oil rubbed on a soft roller cushion, when the goods are framed and dried. Goods of a blue color have a good base for black, yea almost all colors except spirit reds and purples. A good black color can be dyed on silk in two hours, as described.

A fast black is dyed on silk by coloring it a fast indigo blue, then preparing in the nitrate of iron, and dyeing on the top with logwood, fustic, and some nut-gall or sumac liquor, in a kettle.

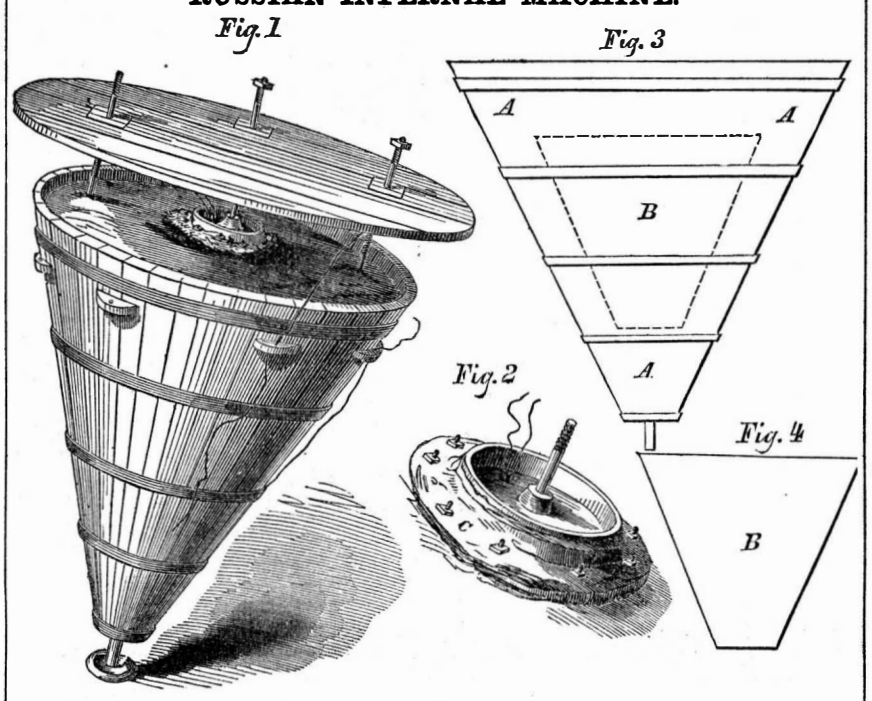
DUTCH BLACK—This color is dyed by preparing the silk in a mordant of alum for one hour, then rinsing in cold water, and dyeing in a tub of logwood liquor (6 lbs. of wood to the 10 of silk) to which a little urine is added for piece goods; but silk yarn, instead of urine, receives a strong solution of soap. The goods are handled in the logwood liquor for half an hour, then washed and dried. By adding some fustic liquor to the logwood, and using neither urine nor soap, a tolerable jet black will be dyed. "Dutch black" is simply a deep logwood blue.

This is a very simple method of re-dyeing ribbons, and can be easily practiced by our farmers' wives, so that they can make old ribbons look as well as new for mourning. They must wash the old ribbons in hot strong soap suds first, to remove all the grease, before they are placed in the alum. When dried, they are easily dressed afterwards, by rubbing over their surface a rag moistened with sweet milk, then ironing them out smoothly on the wrong side with a hot flatiron.

Black crape vails frequently become rusty in appearance; their color is renewed by simply dipping then in a hot solution—not very strong—of logwood. This kind of goods is very difficult to dress. They are run through a strong solution of glue, and *possed* (clapped and squeezed between the hands) in a warm room, till nearly dry, when they are placed in frames, or on a cylinder heated with steam, and thus finished.

Black velvet often becomes rusty in color, and as it is expensive, it pays well to have it re-dyed. This is done by a simple dip in logwood, but great care is taken in handling it, so as not to allow the nap to be laid flat down. The cheapest velvets are the most troublesome to re-dye; there is no trouble with the best quality of thick velvet, because its nap is not easily flattened down. The best quality of velvets can therefore be re-dyed to look as well as new, but not the poor kinds. Soft silks are the easiest to re-dye, and always look best; hard lustring never was intended to be re-dyed. Figured silk goods can be re-dyed black from almost any color, and be made to look nearly as well as new. Those who have old silks which might be converted into blacks from other colors, for mourning, may rest assured that the better the quality of silk, the more certainty there is of good colors, and a good finish.

RUSSIAN INFERNAL MACHINE.



The Allies, England and France, it is well known, have lately concentrated a tremendous number of war vessels in the Gulf of Finland, with a view to the attack and capture of Cronstadt, St. Petersburgh, and other Russian strongholds in that vicinity.

In expectation of such a foray, the Russians appear to have made preparations to give their visitors a warm reception; and as it would have been impossible for them to successfully cope with the Allies *on* the water, they have been trying to see what they could do *under* water.

It appears that the Russians have adopted the expedient of keeping their habors clear of their enemies' war ships by sinking infernal machines, or powder magazines, under water, and so arranging them as to blow up any vessel which passes over.

The harbor of Cronstadt appears to be well supplied with these subtle and dangerous missiles, for on a recent reconnoissance of the place by the English and French admirals, one of their steam frigates came very near being blown to atoms. She exploded two of these machines, whether from contact or otherwise, is uncertain—luckily in five fathoms water; as it was, the one exploding under the starboard bow fairly lifted her out of the water, bulging in the side before the paddle box, and ripping off much copper—at the same time throwing up a column of water alongside, about 14 feet high. Had it happened in shoal water, or had the explosion taken place more directly under her, it would probably have destroyed the vessel and all on board. The inside of one portion of the ship was considerably injured as it was.

The London *Illustrated News* publishes an engraving of one of these infernal machines, which we herewith re-produce. The description of its operation and parts is rather indefinite.

A is the outer case of the machine; B is the inner case, containing the charge of fine gunpowder; C is a thick ring of gutta percha, fitting closely to an inner iron ring above it: within are the wires for igniting the charge. In the entire machine is shown the table-top for protecting the wires, &c. The machine is about four feet in depth, and the circumference of the top about three feet. The whole is made with staves about three inches thick.

These machines, when seen from a vessel's deck, have the appearance of large cylinders moored under water, well below the surface, with a funnel rising from the center to within a few feet of the same, and the probability is, that violent contact causes explosion, though it is perfectly possible, and even probable, that they are fired by batteries from the shore (on the vessel's identifying herself with their position,) more particularly as neither of the explosions which took place were under the bottoms, but alongside, and consequently the amount of damage was small.

In a subsequent search over the waters of Cronstadt harbor, the English seamen discovered, and took safe possession of fourteen of these machines. During an examination by Admiral Seymour, on the deck of his vessel, one of them exploded, and the Admiral himself was wounded, but not seriously.

The first time that explosive machines were ever used in war, for destroying vessels, occurred, we believe, during the Revolutionary War, in New York. It is said that an attempt was made to blow up an English frigate while lying at anchor in the harbor, by means of a submarine boat, which was intended to sink beneath the surface, and enable the operators to fasten and fire a magazine beneath her keel. The men in the boat, however, did not succeed in securing the machine fast, and it exploded near the side of the ship, without damage, but much to the consternation of all on board. The commander immediately slipped anchor and sailed, deeming it imprudent to remain where there was a probability of destruction by such submarine volcanoes.

During the war between the United States and Tripoli a small vessel called the *Intrepid*, was fitted up as an infernal machine to be sent into the harbor of Tripoli and destroy the enemies' vessels. The object intended was successfully accomplished, and materially assisted in hastening a peace.

Cold Water for Toothache.

Dr. Sanborn, of Andover, Mass., recommends a resort to the nearest pump as a remedy for the toothache, where extraction is impracticable. He says that by making cold appliances to parts nearest the offending member, probably in less than an hour the pain would be gone.

In many cases this plan has proven effective; but no more so than hot water appliances; this is our experience.

LITERARY NOTICES.

PHOTOGRAPHIC CHEMISTRY.—This is the title of a work published, from the London edition, by S. D. Humphrey, No. 546 Broadway, this city, the author being T. Frederick Hardwick, late demonstrator in King's College, London. It is a very thorough and able work on this art. It is filled with information of the greatest importance to every one engaged in the Photographic and Daguerreotype arts. The author imparts complete information on the first principles of the art, and, does so in such a manner that the amateur may become well acquainted with his subject. For the practical artisan there is also much information imparted in a simple and satisfactory manner, as we perceive it is addressed to the reader as if he were ignorant of chemistry, thus making it a text book by its explanation of all the processes, the chemicals used, and the "why and wherefore" of the certain results produced.

WICKERSHAM'S IRON WORK AND WIRE FENCES.—A new edition of the work of John B. Wickersham, 312 Broadway, this city, has just been published by Fowler & Wells. It illustrates the different kinds of beautiful wire fences, wire furniture, such as bedsteads, chairs, &c.; also cast iron lintels, girders, capitals, &c., and gives the price of each. The manufactures of Mr. Wickersham are exceedingly beautiful and good. We see, by a large engraving at the end of the work, that he has not given up his celestial railroad for Broadway yet. Well, we may live to see this railroad in operation.

DICKENS' HOUSEHOLD WORDS.—The number for August, of this popular periodical, has been promptly issued by its publishers, Dix & Edwards, No. 10 Park Place. It contains a most interesting and instructive article on "Mechanics in Uniform," being an account of the sappers and miners belonging to the British army.

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